Products Finishing

CLEANING
PLATING
POLISHING
FINISHING

FEBRUARY 1953

Saving Nickel

Lea Copper-Glo

Something New in Bright High Speed Copper Plating

The Ronal Bright Copper Process* using Lea Copper-Glo is the answer to the platers' prayers because it answers the problem of extreme nickel shortages.

Lea Copper-Glo makes it practicable to plate properly prefinished steel and die-castings *directly* with chromium without any intermediate buffing operation. It makes it possible for you to forget your nickel worries.

The user of Lea Copper-Glo enjoys numerous advantages as for example:

OPERATING

- Brilliant ductile deposits
- High current density with 100% efficiency
- Exceptional throwing power
- No wetting agents required
- Direct, interrupted or periodic reverse current

COST SAVINGS

- Reduces tank plating time due to high speed operation. (Hull cell bright current density range 10-60 amp./ft.^{2})
- Reduces rejects whether followed by bright nickel or otherwise; since it contains no wetting agents
- Reduces brightener costs to a few cents/100 gallons of plating solution per day

The Ronal Bright Copper Process using Lea Copper-Glo can be fitted into your plant operating cycle. Regular cyanide or Rochelle Copper baths can be readily converted to obtain these advantages. Write for further information.

* The Ronal Bright Copper Process, using Lea Copper-Glo®, is a development of Ronal Chemicals, Brooklyn, N. Y.

Burring, Buffing and Polishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions

®

THE LEA MANUFACTURING CO.
16 Cherry Avenue, Waterbury 20, Conn.
LEA MFG. COMPANY OF CANADA, LTD.
370 Victoria Street, Toronto 2, Canada

HOW IS YOUR METAL-WASHING MACHINE WORKING?
DO THE NOZZLES CLOG TOO OFTEN?
IS THERE TOO MUCH FOAMING?
EVERYTHING IS O K! WE ARE GETTING OAKITE SERVICE

Is your washing machine removing buffing compounds as thoroughly as it removes cutting oil and metal chips? Is it cleaning brass, aluminum and zinc die castings as well as it cleans steel?

Oakite chemists and service engineers have developed cleaning materials that meet every requirement for washing metal by machine. Oakite Technical Service Representatives know how to make these materials work at top efficiency in all types of machines.

Years of Oakite experience are compressed into a 16-page booklet called "*8 things to look for when you wash metal by machine.*" You'll want to read the notes on:

¶ How to select the best detergent for each job. *See pages 4 to 6.*

¶ When to use a solvent detergent. *See page 7.*

¶ When to use an alkaline detergent. *See page 8.*

¶ How to prepare metal for painting. *See page 9.*

¶ Tips on selection and operation of washing machines. *See pages 10 to 12.*

¶ Special instrument aids to better operation. *See page 13.*

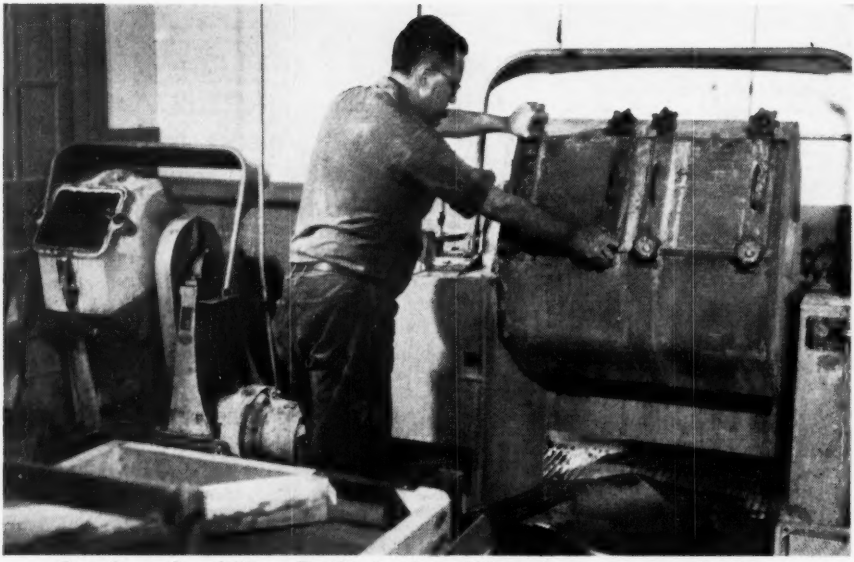
FREE For a copy of "*8 things to look for when you wash metal by machine.*" write to Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. & Canada



One of a number of different Tumbling barrels in which sample parts are processed in the new Norton barrel-finishing department.

New Norton Sample Processing Department Helps Manufacturers Speed Up Production

Plan now to take advantage of this new enlarged service department.

If you'd like to find faster methods for deburring and forming uniform radii on vitally needed parts — or if you have special problems in finishing parts ranging from tiny needles to castings and forgings weighing several pounds — send us samples of your parts. Tumbling is very likely the answer to your problem. And the new Norton sample processing department is the ideal set-up for finding just exactly what you can accomplish through barrel-finishing. Many manufacturers have already realized substantial savings and speed-ups in production through this service.

This new Norton department has a variety of Tumbling barrels of different types and capacities plus auxiliary equipment such as a mechanically vibrated screen. Here, Norton production engineers determine for you — without charge or obligation — just exactly what tumbling can do for the metal parts you send. Detailed recommendations are then given so that you can know exactly how to get the best results for your particular problem. These recommendations include barrel type, size and speed, size and amount of ALUNDUM* Tumbling Abrasives to be used, amount of water, type and amount of compound or cleaner, time cycles and other data.

Send Samples Now

For sample processing, we need: representative sample parts plus (a) the finished sample to be matched (hand-finished, if necessary) and (b) information on your present barrel-finishing equipment, if any, including type and size of barrel and barrel speeds. These should be sent to Norton Company, Worcester 6, Massachusetts, attention of Sales Engineering Department, Abrasive Division. About a week is required for processing the samples after they have been received.

Meanwhile, for further information get the 55-page Norton handbook on barrel-finishing. Ask your Norton Distributor for Form 501 or write us direct.

*Trade-Mark Reg. U. S. Pat. Off.

NORTON COMPANY, Worcester 6, Mass.
Distributors In All Principal Cities
Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

NORTON
ABRASIVES
Making better products to make other products better

Evenly distributed ventilation, too. That means air-cooled operation even under severest use–more pressure without burning–faster cut–more composition mileage–and longer life for the buff. Air rushes into those extra large holes at the center, circulates right through the wheel, and escapes at the face. This constant flow of air–plus the fanning effect of the ruffles at the face–*eliminates excessive heat.*

Now take a look at the rest of these features: There's an extra safety factor in the rugged steel ring that anchors the cloth at the center; every buff is perfectly balanced; and that exclusive H-VW-M Red-E-To-Use Face is all set to take composition without raking or truing. Ruff-L-Buffs are available in a wide variety of types and weights for any application–to do a *better* buffing job for *you.*

Top quality buffs are just one of many results of over eighty years of constant electroplating and polishing development–a continuing policy summed up in H-VW-M Platemanship . . . your working guarantee of the best that industry has to offer–not only in buffs–but in every phase of plating and polishing.

PLATEMANSHIP

For full information on Ruff-L-Buffs as well as all H-VW-M buffs ask for Bulletin B-100.

Your H-VW-M combination–of the most modern testing and development laboratory–of over 80 years experience in every phase of plating and polishing–of a complete equipment, process and supply line for every need.

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H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

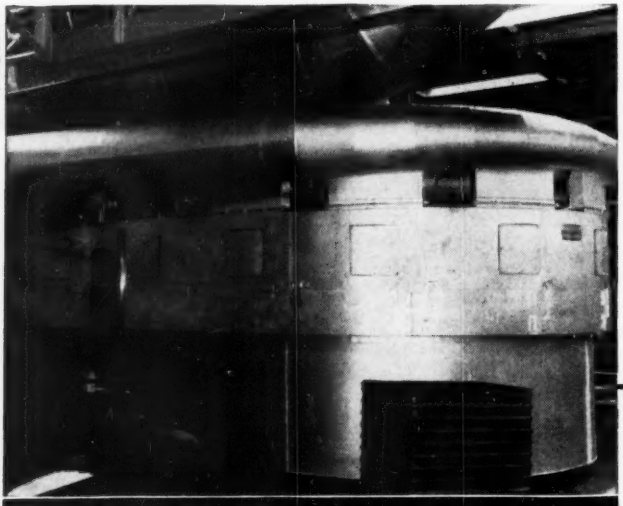
KIRK AND BLUM
FUME CONTROL SYSTEM
Saves 5 Ways..

1. REDUCES AIR VOLUME
2. LOWERS MAINTENANCE COSTS
3. CUTS REPLACEMENT COSTS
4. IMPROVES WORKING CONDITIONS
5. ELIMINATES DAMAGE TO OTHER EQUIPMENT

In large and small plants, Fume Control Systems engineered, fabricated and installed by KIRK & BLUM show substantial savings by increasing the life of costly plating equipment.

Here, a hood—with convenient access openings encircles the tanks — preventing cross currents and reducing air volume requirements.

Fumes are picked up at the outside of the tank, clean air is drawn over the machine's mechanism in the center, thereby keeping damaging corrosive fumes away from costly moving or mechanical parts.



KIRK & BLUM Fume Control on an Automatic Plating Machine in a noted auto ignition parts plant. Note hinged anode access and inspection doors just above tank top.

Write for Booklet F, showing typical installations.

The Kirk & Blum Mfg. Co.,
3116 Forrer Street,
Cincinnati 9, Ohio

VOLUME 17 NUMBER 5
FEBRUARY, 1953

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Products finishing

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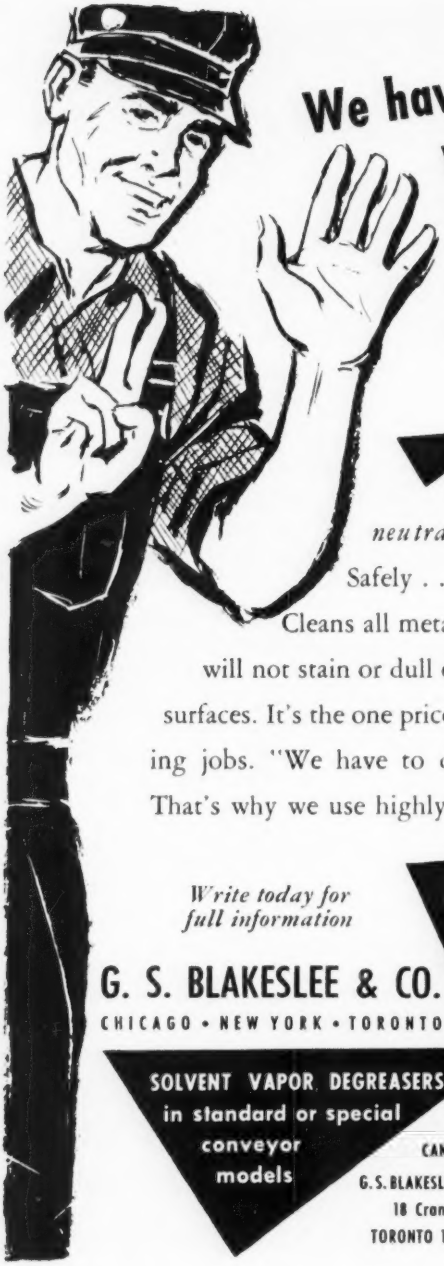

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(the highly stabilized solvent)

BLACOSOLV gives you greater stability with its *neutral* stabilizers. Does the job Safely . . . Quickly . . . Economically. Cleans all metal or combination of metals—will not stain or dull even the most highly polished surfaces. It's the one price solvent for all metal degreasing jobs. "We have to degrease a variety of metals. That's why we use highly stabilized solvent".

Write today for full information

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SOLVENT VAPOR DEGREASERS in standard or special conveyor models

NIAGARA-METAL PARTS WASHERS—built to fit your needs

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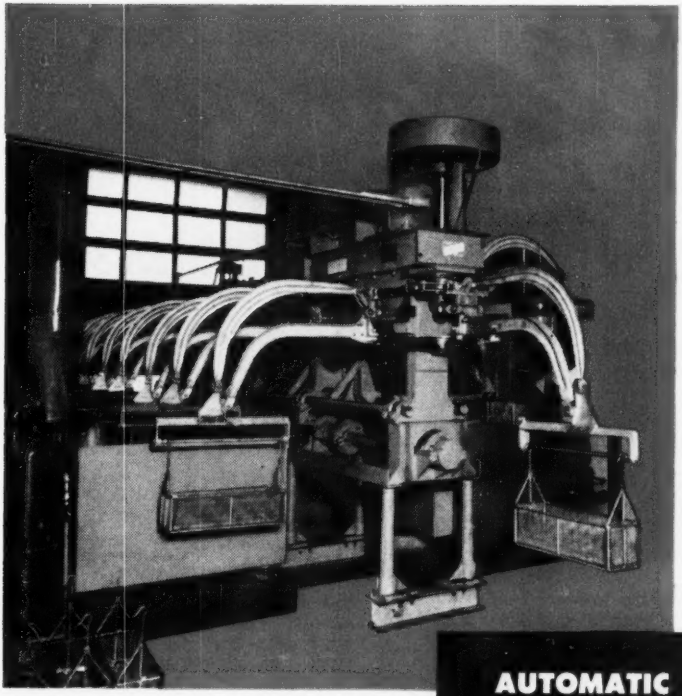

Stevens full Automatic at National Cored Forgings Company

AUTOMATIC BRIGHT DIP AT NATIONAL CORED FORGINGS CO.

GIVES HIGH PRODUCTION
—UNIFORM RESULTS
—IN LESS SPACE!

Yes, that's the report of National Cored Forgings Company of South Norwalk, Conn. More work . . . better results . . . with less space . . . thanks to Stevens equipment!

This Company produces items ranging from lens caps to padlock cylinders. In each case, bright dipping is a necessary step to a bright finish. That's where Stevens pays off.

Automatic bright dip assures uniform results PLUS high production. Frederic B. Stevens supplied the answer to National Cored Forgings Co. high production bright dip problem.

Let Frederic B. Stevens help solve your plating problems. Call or write direct. Frederic B. Stevens, Inc., Detroit 16, Michigan.

FREDERIC B. STEVENS INCORPORATED
EVERYTHING FOR METAL FINISHING
DETROIT 16, MICHIGAN

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Hammond

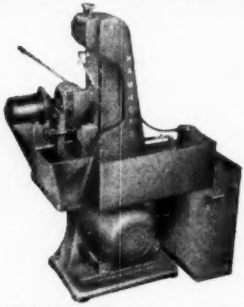
of KALAMAZOO

A COMPLETE LINE OF

GRINDING, POLISHING AND AUTOMATIC FINISHING MACHINERY

MODEL VRO LATHE

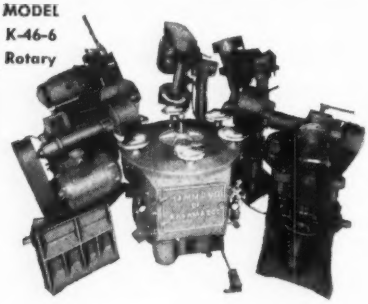
Variable Speed Polishing Lathes — Single and two spindle Lathes — 1500 to 3000 RPM. Also made in single speed models. Also furnished with Backstands for abrasive belt polishing.



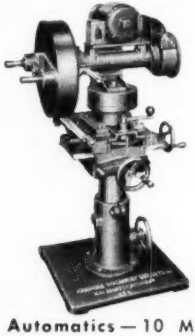
MODEL OD-1

Cylindrical Finishing Machines — For tubes, bars and cylindrical shapes: Model OD-1 up to 2¾" diameter polishing or buffing. Model OD-9 with polishing wheel or belt, for ¼" to 9" diameter.

MODEL K-46-6 Rotary



Rotary and Strait-Line Automatic Finishing Machines — For fast production polishing, buffing, deburring and brushing — Model K-46-6 Rotary shown. Write for catalog on Rotary and Strait-Line Automatics.



MODEL E2PF

Junior Automatics — 10 Models to choose from, according to work requirements. With one, two or four spindles — simple rotating spindle or stroke movement—for use in conjunction with polishing Lathes.

Hammond Machinery Builders INC.

1622 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

See us at Booth 206—Western Metal Exposition

NEW

HOUGHTON'S COLD CLEANING COMBINATION CLEANS METALS EFFECTIVELY AT ROOM TEMPERATURES

Have you long wanted a cleaning procedure on production lines that would remove soil and oil *without* having to use a HOT wash?

Now you can have it—in Houghton's new and proved cold cleaning combination that works effectively at room temperatures. Here are the definite advantages:

No heating costs . . . that saves plenty!

No need for stacks, vents, burners, heat controls

No tendency to rust immediately after cleaning

No trouble in mixing

No extra expense for the cleaner itself—solution life is longer

No parts too hot to handle

No annoyances to personnel from hot, steamy installations

Write now for the bulletin describing Houghto-Clean 439 and 440, Houghton's combination of alkali-solvent-wetting agent, for use in power washers on production lines at room temperatures.

COLD CLEANERS

HOUGHTO-CLEAN 439 and 440

. . . products of

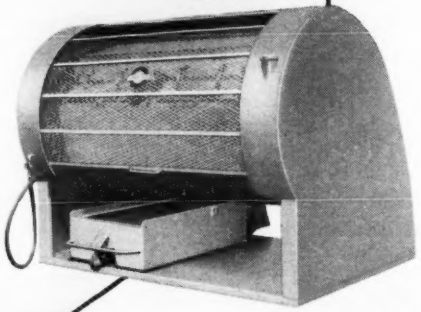
E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

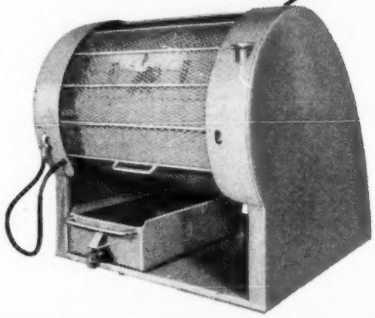
Ready to give you on-the-job service . . .

FINISHING AD #1-53

Come to TUMBLE GRAV-I-FLO FINISH for ALL your tumbling needs!



Model 66″, two compartments



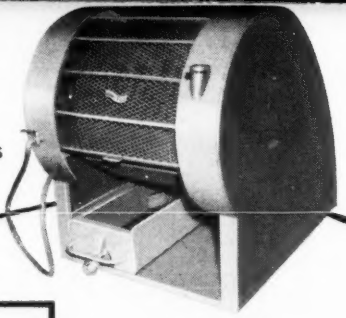
Model 48″, two compartments

You can get complete equipment and supplies for faster, better tumbling at Grav-i-Flo. This authoritative tumbling source can furnish you, from its years of experience, the correct answer to any tumbling problem.

Larger capacity machines take 31% to 80% more work-load in same floor space. Improved cutting materials shorten cutting cycle by 15% to 25%. Grav-i-Flo installations substantially reduce capital investment, floor space, and production time!

MACHINES

Grav-i-Flo 66″, 48″ and 36″ machines have cam locked doors with manually released safety stops; available with unlined or rubber lined cylinders, constant or variable speed drive, J.I.C. controls, and timers from 5 minute to 20 hour cycles. Equipped with electric wiring and water piping installed ready for plant hook up.



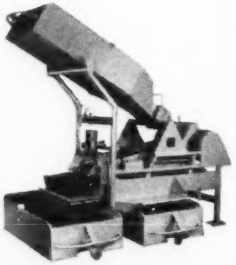
Model 36″,
two compartments

Model 24″,
two compartments

Designed For Small Lot Production and Laboratory Processing.

ACCESSORIES

Two deck parts-and-chips separator and chip grader



Occupies less floor space. Separates parts quickly without impingements. Grades 3 sizes of chips simultaneously.

Other Grav-i-Flo accessories include tubular yoke hoist pans, chip pans, wash-out doors, screens, chip bins, unloading boots, dip tanks.

Chips and compounds

Grav-i-Flo natural and synthetic deburring and finishing chips and highly developed compounds consistently outperform every type of tumbling process offered on the market.

Investigate!

Grav-i-Flo superiority in equipment and supplies has been proved to hundreds of users in many different industries. Let us show you, too, at no obligation. Our representative will visit your plant, or send samples direct to us. Engineering Service available to all users.

SEND FOR CATALOG showing complete line of Grav-i-Flo equipment, accessories and supplies.

THE GRAV-I-FLO CORPORATION

Dept. PF2, 400 Norwood Avenue
STURGIS, MICHIGAN

ENGINEERED SERVICE

PHILLIPS PRODUCTION DEGREASING BULLETIN

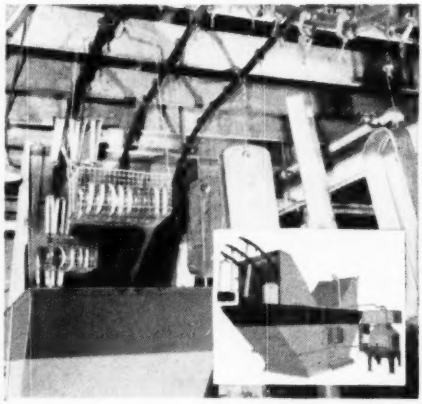
PRODUCTION LINE DEGREASER SAVES OVER 50 MAN-HOURS PER DAY!

Steger Products Builds Phillips Monorail Conveyor Type Unit Right Into Production Line

Steger Products Manufacturing Company saw the need for integrating fast, efficient degreasing with their complete production line. So in place of hand dipping in liquid solvent, (a slow, costly degreasing process) they now use a fast, efficient Phillips monorail conveyor type degreaser. All parts for the various products produced enter the degreaser on three separate monorail conveyor lines and emerge completely cleaned *without being handled by any worker.* Steger estimates that this automatic degreasing saves over 50 man-hours per day over the old method. Without this production degreaser the whole line would be slowed to the tempo of out-moded cleaning methods.

As a consequence many more units of each part are degreased in a day's time—completely—automatically. And the parts are thoroughly clean and ready for the next operation in the production line.

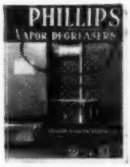
This is just one example of the efficiency effected by many manufacturers who use fast, economical Phillips vapor degreasers in their production operations. Check with Phillips today for the answer to your degreasing problems.



Parts emerge from degreaser on three separate conveyor lines ready for the next operation. Inset shows degreaser complete with solvent recovery still.

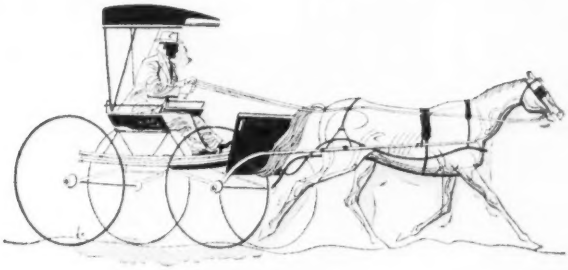
New Illustrated Degreaser Bulletin Offered

Phillips Manufacturing Co. offers its newly published degreaser catalog to any one who wishes to obtain a copy. It describes the full line of Phillips degreasers and shows many various and interesting industrial applications. Write Phillips Manufacturing Co., 3457 West Touhy Avenue, Chicago 45, Illinois.



(Advertisement)

Perhaps YOU WERE NOT YET BORN

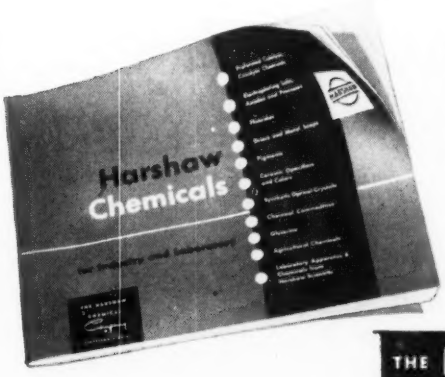


when Harshaw first produced plating materials

Then again, perhaps you plated with Harshaw nickel as far back as the year 1898 . . . when we started producing for the plating industry.

If you are an old-timer, then you know first-hand the dependability of Harshaw plating materials. And you know how often Harshaw has been **FIRST** with important new developments . . . For instance, back in the 20's when our discoveries brought "rolled depolarized and rolled carbon" nickel anodes, and in 1934 when Harshaw developed "Nibrite," the first ***bright*** nickel. Harshaw installed the first commercial bright electroplating bath in 1935.

That was a famous first, as you will recall. Of equal importance, too, were our introductions of fine crystal single nickel salts, and Perflow, the first truly leveling nickel deposit.



If you're a youngster, well then you should know more about us, and for that reason we have prepared a 16-page booklet which tells all about us — how thoroughly we serve the plating industry, and other major industries such as ceramic, petroleum, metalworking, paint, and others as well. Write for this free booklet. We'll be happy to send it.

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

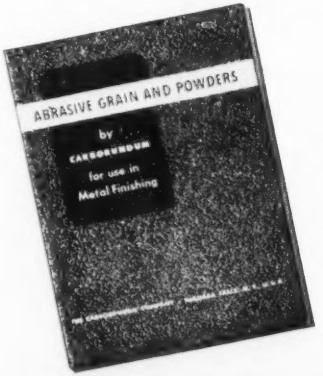
There's ONE Grain HERE that's right for YOU

GRAIN TYPE	CHARACTERISTICS	PRIMARY USES
ALOXITE TP **Aluminum Oxide**	Tough, blocky. Standard grit sizes from 16 through 220.	Polishing operations involving heavy stock removal on steel and other high tensile strength metals.
ALOXITE TPT **Aluminum Oxide**	Tough, sharp. Grits 16 through 100.	Polishing operations involving removal of large amounts of metal (e.g. plowshares).
ALOXITE TPL **Aluminum Oxide**	Very sharp, friable. Grits 16 through 220. (It fractures during use, thus reduces loading of the wheel surface).	Polishing low tensile strength metals—copper, brass, bronze, aluminum.
ALOXITE TPC **Aluminum Oxide**	Medium sharp. Grits 16 through 220.	General purpose polishing grain—for removal of small amounts of metal.
ALOXITE TPW **Aluminum Oxide**	Powder. Grits 240 through 1000.	As the abrasive in paste heading of polishing wheels and belts.

...are you using it?

CARBORUNDUM RA Silicon Carbide	**Sharp, very friable. Grits 10 through 240.**	**Polishing cast iron.**
CARBORUNDUM RA Silicon Carbide	**Powder. Grits 280 through 600.**	**General purpose polishing.**

HERE'S THE BOOKLET that tells you everything about the finishing of metals with abrasive grain and powders ... how to size, cast and cure your polishing wheels—how to recondition used wheels, etc. Also full discussion of metal buffing, tumbling, blasting and litho plate graining with abrasives by CARBORUNDUM. Send for your copy today. No charge—no obligation. Just write to Dept. PF 83-51.



CARBORUNDUM

TRADE MARK

the ONLY source for EVERY abrasive product you need

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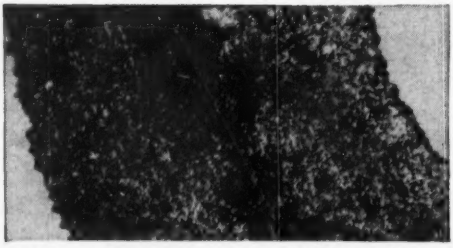
83-51R

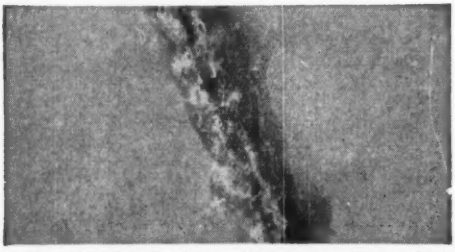
Proved In Industry

Prep-n-Cote

An Established Iron Phosphate Coating and Cleaning Product



Ordinary Solvent cleaning, (magnified 5 times) completely failed at 72 hours under salt spray fog. A.S.T.M. Spec. B-117-T-44.



Prep-n-Cote panel, (magnified 5 times) after 704 hours exposure to salt spray fog. A.S.T.M. Spec. B-117-T-44.

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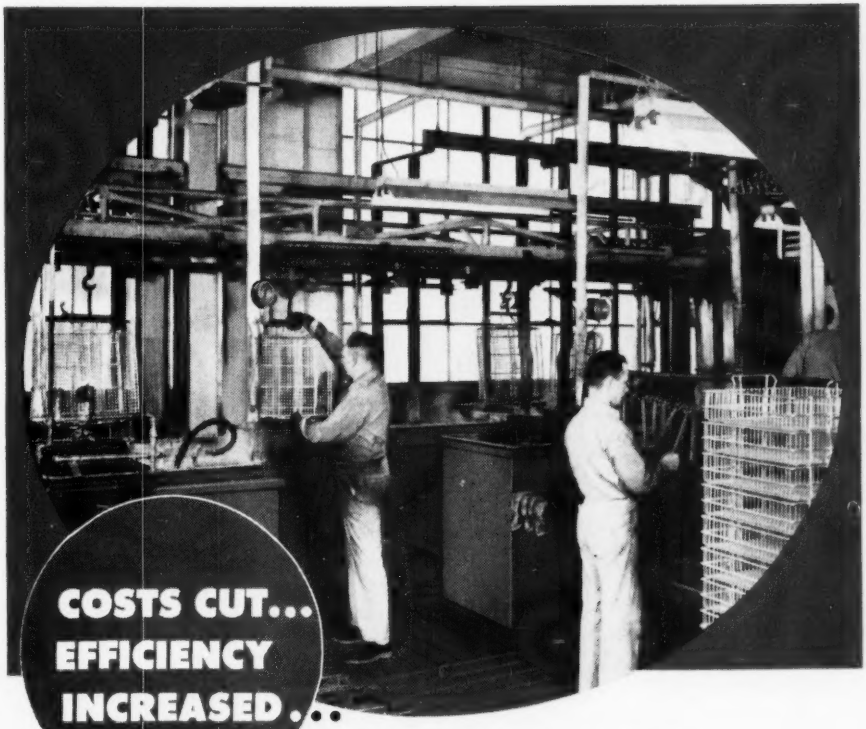

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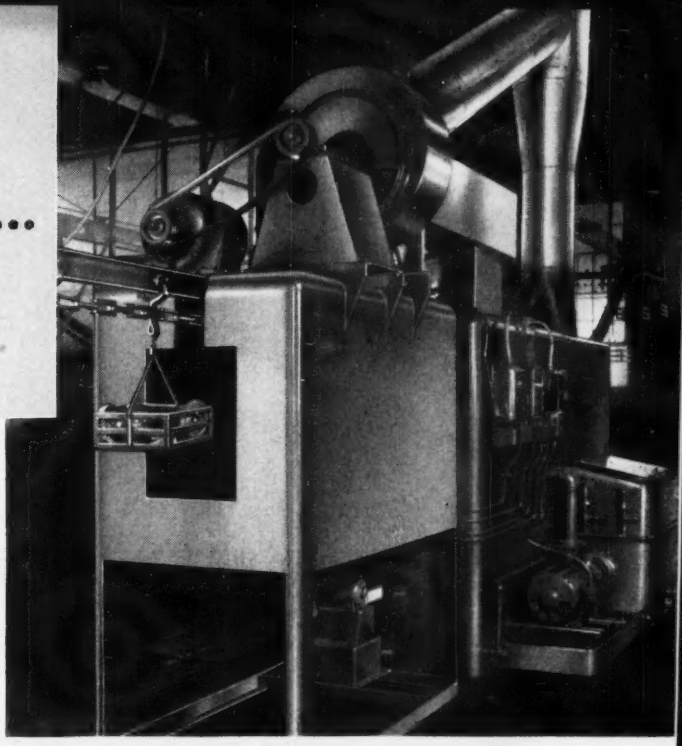

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pf editorial

FEBRUARY, 1953

Vol. 17, No. 5

Something for Something!

It is most impressive to review the new electroplating and finishing processes, techniques and materials which are being developed or perfected almost constantly, and likewise, the many products generally entitled plating and finishing equipment which result from continual development, redesign, or modification in the interest of greater efficiency and increased user satisfaction.

This happy state of affairs represents progress in the finishing industry.

However, each new development may tend to create the impression that it constitutes "something for nothing." Nothing could be farther from the fact.

Into the development or improvement of each product has been poured a great deal of effort and, of course, expense. The engineering and research staff constitutes a substantial portion of the overhead expense of each equipment manufacturer. Naturally, each manufacturer is anxious to keep his product in a high state of development, or to develop new products. The effects of the efforts of individual manufacturers and other research agencies are quite noticeable in the finishing field. The many new developments benefit the entire industry.

As any finishing foreman or finishing engineer knows, there is no single process that eliminates all others. There are eight or nine ways to clean metal prior to finishing; there are four ways to apply paint, plus a number of variations of the processes; metal may be deposited by electroplating, simple immersion, metal spraying, hot dipping, or vacuum evaporation. The plant man must study each new process, material, or machine to determine how it may be adapted to his present finishing system. That effort is fully justified by the possible advantages and improvements to be attained through the adoption of the new idea.

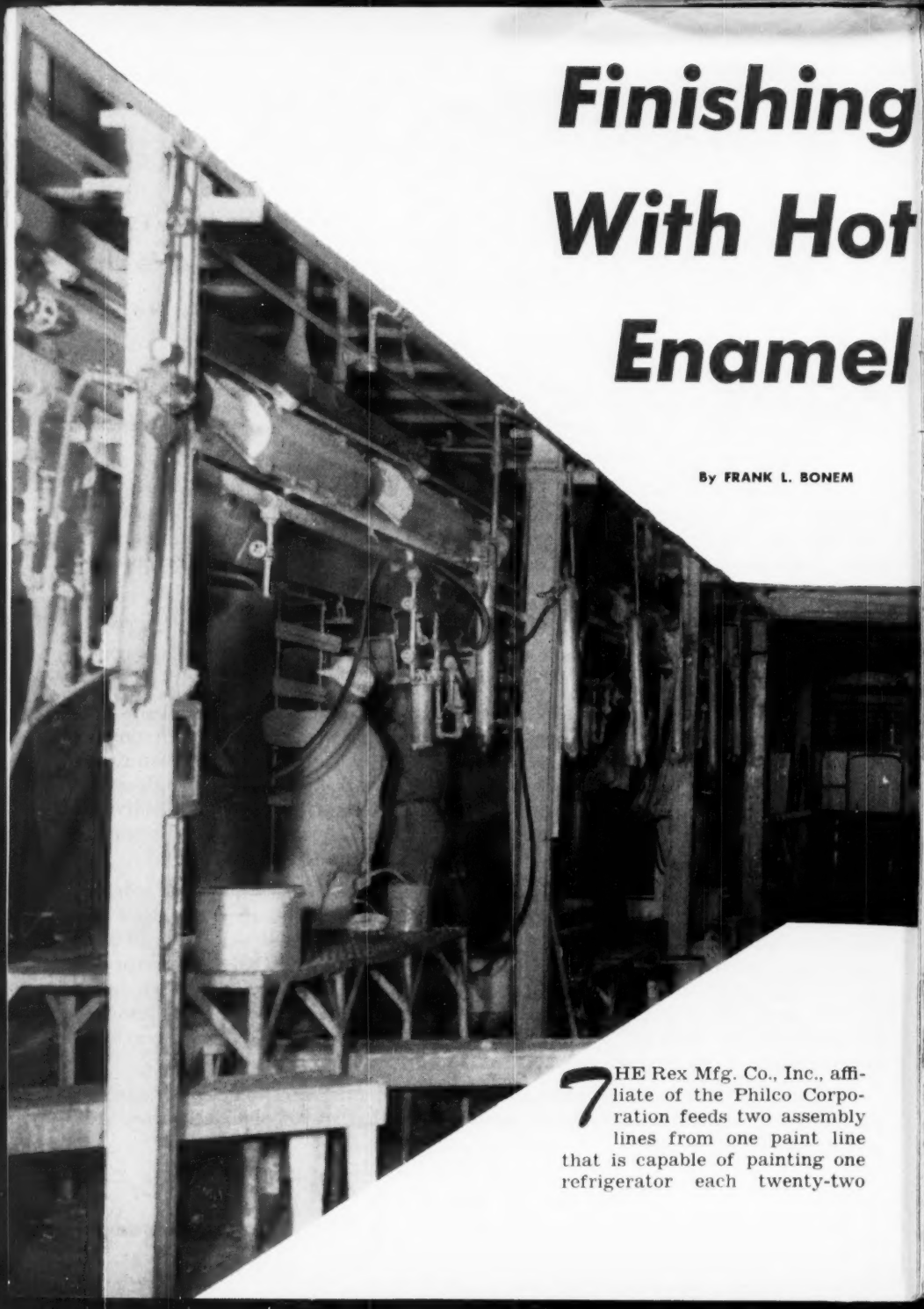
The new developments represent a joint effort by the developer and the user; they make it possible to keep your plant in a high state of efficiency; they are worthwhile investments.

Ezra A. Blount

—EDITOR

Finishing With Hot Enamel

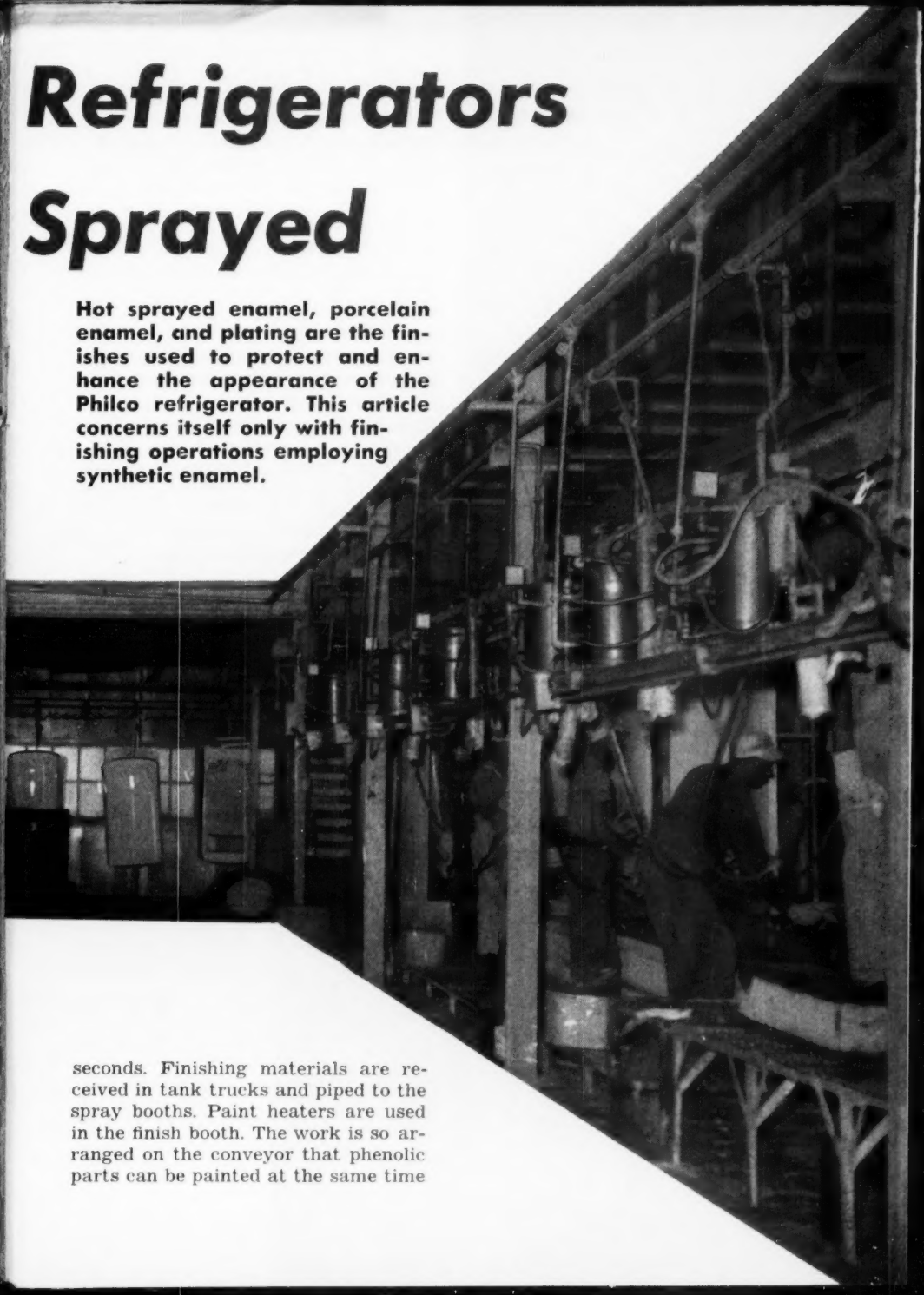
By FRANK L. BONEM



THE Rex Mfg. Co., Inc., affiliate of the Philco Corporation feeds two assembly lines from one paint line that is capable of painting one refrigerator each twenty-two

Refrigerators Sprayed

Hot sprayed enamel, porcelain enamel, and plating are the finishes used to protect and enhance the appearance of the Philco refrigerator. This article concerns itself only with finishing operations employing synthetic enamel.



seconds. Finishing materials are received in tank trucks and piped to the spray booths. Paint heaters are used in the finish booth. The work is so arranged on the conveyor that phenolic parts can be painted at the same time

Fig. 1—View of one of the 250-ton presses used to form large parts, such as back walls, of the refrigerators.

the metal parts are painted, making it possible to deliver complete sets of parts to the assembly lines.

Fabrication

For fabricating the refrigerators, cold rolled 20 gauge steel is used for shells, doors, and other exterior parts, and 14 to 16 gauge steel for structural or supporting members. Doors and back walls are formed in presses such as shown in Fig. 1, while various other parts are bent, pierced, trimmed, and formed in other punch presses and bending machines as shown in Fig. 2.

All basic assembly operations are by resistance welding in automatic machines (see Fig. 3), and by hand units on a roller conveyor assembly line. At the end of this assembly line, floor space is allocated for mechanical finishing of the bodies. Here weld marks and surface irregularities are removed with ding hammers and air-powered hand sanders. Doors are sanded on a small belt conveyor (see Fig. 4); smaller parts on polishing lathes. Behr-Manning 80-grit abrasive discs are used on the hand machines. Set-up wheels, used on the lathes, are glued and sized in the department.

The Finishing Process

Adjacent to the mechanical finishing area is the loading point for the conveyor which moves the various components of the refrigerators through all finishing operations to the final assembly floor. The major steps in this finishing process are as follows:

1. Clean and phosphatize.
2. Dry.
3. Tack wipe.
4. Apply first primer.
5. Apply compound into "Dutch bends."
6. Apply second primer.
7. Bake.
8. Tack wipe.

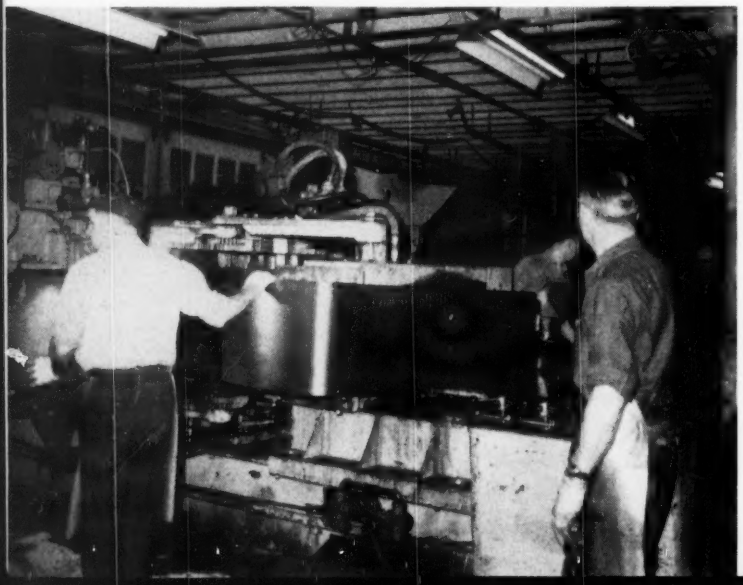


Fig. 2 — One of two bending machines, employed to bend the top and outer walls. A new blank is fed into position prior to the removal of the formed part.

9. Apply finish coat.
10. Bake.

The conveyor system, designed by Conveyor Systems, Inc., consists of a single Standard No. 458 drop-forged rivetless chain of 2-inch pitch. It has three drives, 3 take-ups, numerous roller turns, and travels at a rate of 18 to 19 f.p.m. Hooks are at 24-inch centers with the work loaded on every second hook or at 48-inch intervals.

Because the chain goes through all the processing phases and even travels for 100 feet on the outside of a building, thereby being exposed to atmospheric conditions the year around, definite preventive maintenance measures are taken. These consist of cleaning the chain by passing it through two revolving wire brushes, and oiling the trolleys after they are cleaned. The oiling is unique in that as each trolley leaves the brushes, it kicks a lever which opens a valve and allows a jet of oil, powered by compressed air, to oil it thoroughly.

From the loading area the conveyor carries the parts through a six-stage, U-shaped, spray cleaning and phosphatizing installation (see Fig. 5). In the first stage parts are cleaned and slightly coated, the treating solution containing mostly Ridosol* 551 with small amounts of Granodine* 500 and 501. The solution is recirculated from a 3,000-gallon tank and is kept at 150 deg. F. and a pH of 5.0 to 5.2. The second stage is the reverse of the first, the solution being mostly Granodine 500 and 501 with small amounts of Ridosol 551, and only slight cleaning action takes place but more of a coating is deposited. The temperature of this solution is the same as for stage 1; how-

Fig. 3—A multiple-station, resistance welding machine in which back walls are welded to the top and sides of the shells.

* Reg. Trademark, American Chemical Paint Company.

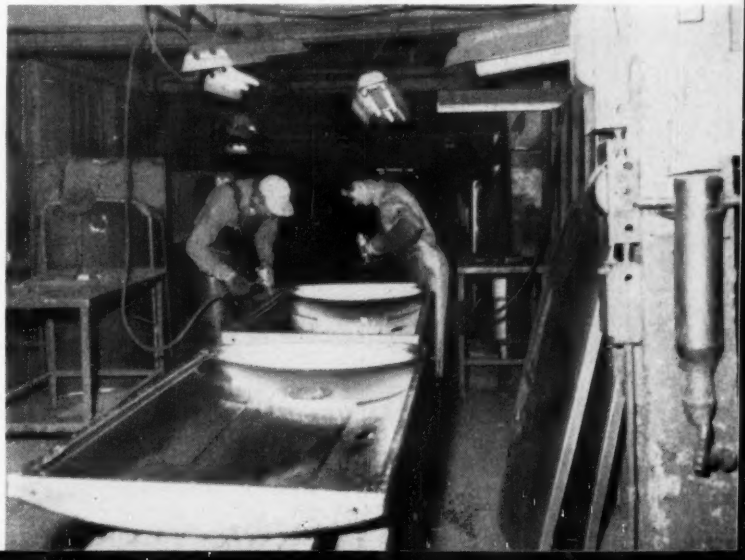


Fig. 4 — View of the belt conveyor line where doors are mechanically finished with air-operated disc sanders.

ever, the pH is 5.8 and only a 1,800-gallon recirculating tank is used.

Stages 3 and 4 are coating stages in which Granodine 500 is appiled at a temperature of 150 deg. F. Recirculating tank capacities are 1,800 and 3,000 gallons, respectively.

Room temperature water is used for rinsing in stage 5, and in the final or sixth stage, an acidified chromate rinse is applied at 120-130 deg. F. for neutralizing, passivating, and providing a uniform coating. Length of the various tunnel sections is approximately the same so that the time in each stage is about one minute. The amount of solution applied and the angle at which the spray strikes the work are controlled by the number and the positions of Vee Jet and Whirl Jet nozzles, each stage being somewhat different.

After phosphatizing, the parts are conveyed to the second floor where they enter a dry-off oven. Circulating air, heated by two oil burners, keeps the oven at 280 deg. F. A few feet from the entrance of this oven an operator goes over the large parts with a De-Vilbiss air gun. The warm, compressed air drives droplets and excess moisture from corners and bends and thereby makes possible an oven drying time of about 12 minutes.

Coming from the dry-off oven, cabinets are wiped with tack rags on the top, turned upside down on the conveyor fixtures, and then wiped with tack rags on the remaining surfaces. Smaller parts are wiped with tack rags in one operation. For stubborn grease spots on any of the parts, naphtha-moistened tack rags are used. Cabinets are hung right side up on the conveyor for phosphatizing, because their shape lends itself better to automatic spraying in cleaning, draining, and drying in the oven. Cabinets are suspended in the reverse position for

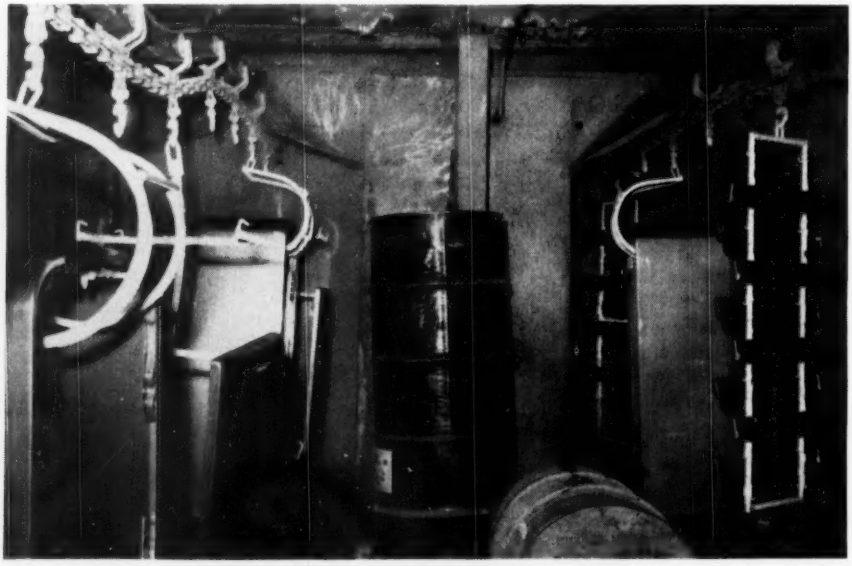


Fig. 5—Entrance (left) and exit (right) of the U-shaped phosphatizing installation. Three stages are located on each side of the unit.

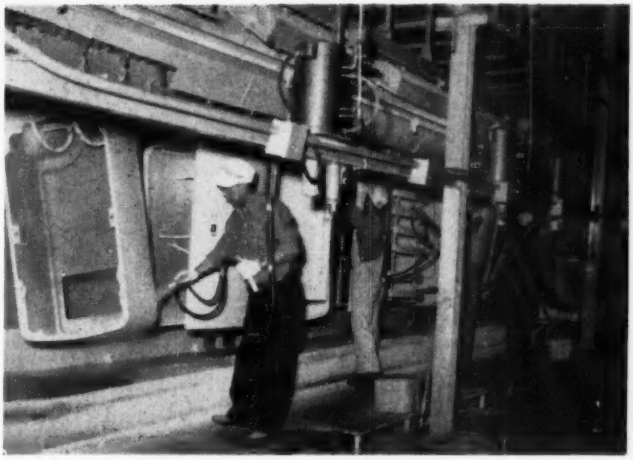


Fig. 6—A view of the hot spray paint booth showing the location of the Bede paint heater in relation to the piping and spray guns.

hand spray painting.

After being wiped with tack rags, parts are again dusted with air guns. This time, however, special attention is paid to those surfaces which will receive a special zinc primer coat. These surfaces are in areas which, in field service, will be particularly exposed to moisture. Thus, areas such as the concave food compartment door bottoms are doubly protected by first receiving a coat of a zinc powder dispersed in a varnish vehicle and applied with a spray gun.

A second extra protection measure which is taken at Rex is that of applying a primer into "Dutch Bends" with a special gun which forces the primer, for this purpose in the form of a high viscosity paste, into these bends and corners.

Spray Painting

The regular primer and the finish coat are applied in two 54-foot long DeVilbiss spray booths (see article heading) which are located opposite each other. While traveling through the primer booth (left, article heading) seven painters apply the primer cold with Binks No. 19 spray guns at a fluid pressure of 18 p.s.i. and an air pressure of 65 p.s.i. Air exchange in this huge water curtain booth is at a rate of 150,000 c.f.m. Paint sludge is recovered from the 4,500 gallons of circulating water by the use of a water wash spray booth compound.

From the primer booth, parts travel down to the floor below and into the first oven for a bake of approximately 45 minutes. The conveyor makes four loops in this oven, thereby allowing the parts to traverse the oven's full length five times. The conveyor makes another pass directly above the ovens, which permits parts to cool off.

Parts re-enter the work area and the primer coat is spot sanded with Carborundum O.P. 280 finish paper where necessary. All parts are again wiped with tack rags prior to entering the second booth for the finish coat. This final coat, Du Pont Dulux white enamel, is applied hot, each of the seven spray gun stations having its own Bede paint heater (see article heading right, and Fig. 6). The enamel is applied at a fluid pressure of 24 p.s.i., an air pressure of 65 p.s.i., and a temperature of 160 to 180 deg. F. at the heaters. Air exchange in this booth is 150,000 c.f.m. Two fans with a total capacity of 150,000 c.f.m. provide both spray booths with filtered air.

From the second booth the conveyor again dips down, this time into the second bake oven. After traveling

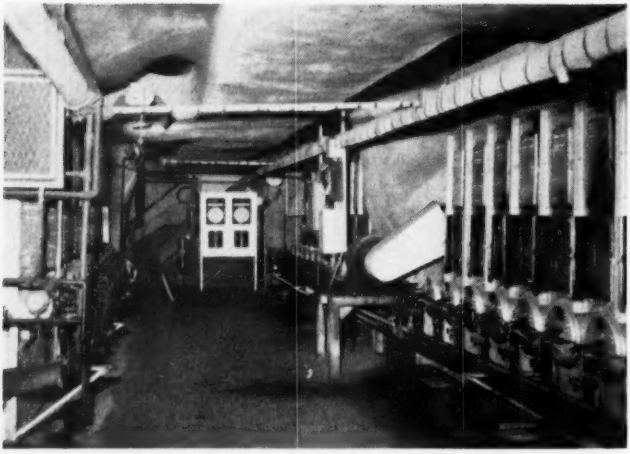


Fig. 7 — This furnace installation provides heated air for the bake ovens. The two batteries of ten burners each (right) serve the primer oven; the battery of 16 burners (left) serve the finish oven.

through this oven for 45 minutes, the conveyor again rises and cools parts off by conveying them above the full length of the second bake oven.

The bake ovens, designed and manufactured by Drying Systems, Inc., Chicago, are 180 feet long, 11 feet high, and 53 feet wide. They are located side by side and directly above the furnace room. By this arrangement of having the ovens directly above the furnaces and cooling the parts off directly above the ovens, heat loss is reduced to a minimum and considerable savings are realized. The sides of the ovens are made of 4-inch double metal panels with insulation between, and the floors are lined with fireproof heat resisting cement. The roof of each oven has two sets of "blow-out" explosion panels.

Theoretical baking time and temperatures for 100 per cent bake are 60 minutes at 290 deg. F. for the primer oven and 60 minutes at 260 deg. F. for the finish oven. Due to the heat-saving arrangement mentioned in the preced-

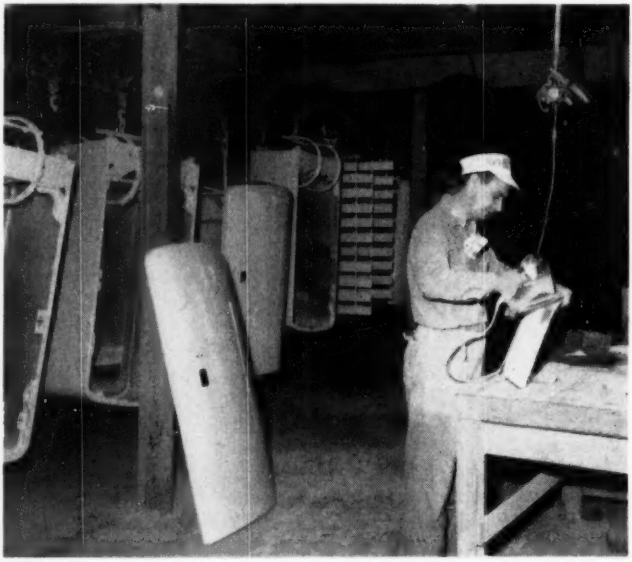


Fig. 8—Parts emerge from the final bake (rear center) and are inspected. Defective parts are removed from the conveyor and the bad spots sanded down to bare metal.

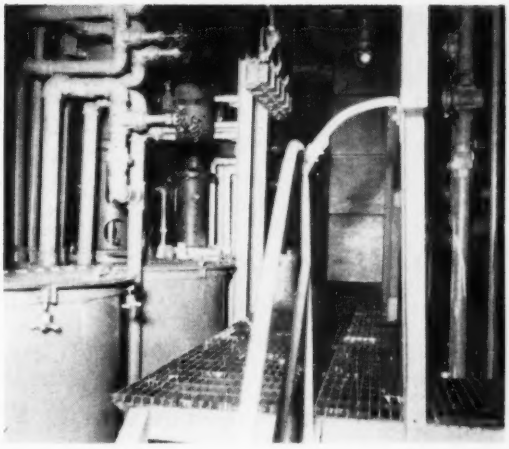


Fig. 9 — View of the paint storage room showing the four 500-gallon mixing tanks.
(All photos by PRODUCTS FINISHING)

ing paragraph, actual temperatures are 330-340 deg. F. in the primer oven and 285-290 deg. F. in the finish oven. Total traveling time in the ovens is reduced to 45 minutes with actual baking time 37½ minutes.

Three fans circulate the heated air using 40 per cent fresh filtered air with each pass. The fans and aluminum filters are mounted in the furnace room along with the two banks of oil burners as shown in Fig. 7. Two batteries of ten burners each supply the heat for the primer oven; one bank of 16 burners supplies the finish bake oven.

Final Assembly

After parts have cooled from the final bake, they are carefully checked for appearance. Any components with a defective coating are removed from the conveyor at various stations. The rejects are sanded down with electric hand sanders, using 300 grit Carborundum abrasive paper (Fig. 8), and then travel through the complete finishing system again.

Cleared by inspectors, parts travel to the final assembly department where they are taken from the conveyor. Here the "tank" or inside lining, which has been finished in white porcelain enamel, meets the outer shell, and, together with insulation, is mounted in the shell to begin the assembly process. The refrigeration mechanism is installed and the back wall attached. Doors are assembled with insulation between the inner and outer panels, and plated door handles and decorative designs are attached. On the final assembly line compartment shelves, ice trays, and so forth, are installed. The refrigerators are assembled on the base of the packing crate, a standard procedure in streamlined production.

Paint Pumping and Storage

With a total paint usage of over 4,000 gallons a week, extensive facilities must be provided for storing, mixing, and pumping paint. At Rex the paint storage room is located below the paint room and near transportation facilities. It is completely enclosed, has no windows, and but one steel door. Fresh air is continuously circulated, entering through a forced air inlet and exhausting through vents located six inches above the floor.

The room contains a total of eight storage and mixing tanks. Four of the tanks are for storage and have a capacity of 2,000 gallons each. The other four tanks are for mixing (see Fig. 9), and are located opposite the storage tanks. A 1,500-gallon storage tank for thinner is located under the floor.

For thorough mixing of paints and solvents, shafts on which two propellers are affixed, one at the center and one at the bottom, extend into the mix-

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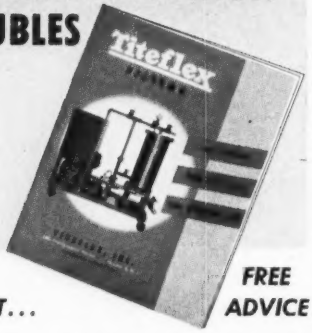

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ing tanks. The shafts are rotated at 60 r.p.m. by 5 h.p., vertically mounted, explosion-proof motors. Viscosity is adjusted during mixing to 56 on a No. 7 Parlin Cup for the primer, and to 25 on a No. 10 Parlin Cup for the finish coat.

Adjacent to the paint storage room is the pump room in which five 4 g.p.m. centrifugal pumps are located. Two pumps handle the primer and two pumps the enamel. However, only one pump is used at a time for each, the other being a standby unit. The fifth pump is used for pumping solvent from the underground tank. Piping is arranged so as to continuously circulate primer and finish coat. Only the paint actually used at the guns goes through the heaters since the lines going to the heaters are tapped into a header running the length of the spray booths (see article heading). In this system all paint is filtered three times before entering the spray guns. Filters are located between mixing tanks and pumps, pumps and piping in the paint room, and between the paint heater and spray gun.

Process and Quality Control

Process control is first exercised in the phosphatizing installation where one man checks the solutions every hour. The same man also checks the pH of the water in the paint spray booths every three hours. Oven temperatures (thermostatically controlled) are checked daily by running a Bristol temperature recorder through the ovens on the conveyor. From the charts of these recorders the percentage bake is calculated. Finally, the thickness of the coating is checked periodically at the point where the parts emerge from the final bake oven. Actual thickness of the coating is 2 mils; 0.8 to 1 mil for the primer and 1 to 1.2 mils for the finish coat.

Other controls, which are used at Rex to ensure quality of the final fin-

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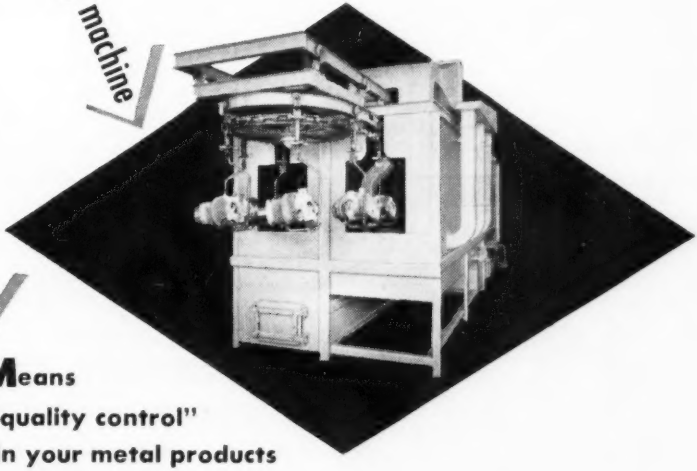

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ish, are humidity, salt spray, and hardness tests. The panels, 6 by 12 inches in size, are prepared, coated with the complete finish, and tested in the humidity cabinet. The panels are subjected to a 500 hour test and must show no breakdown. Also, actual production parts are continually checked in the humidity cabinet. Suppliers' materials are tested by the same method constantly. The salt spray cabinet is used for periodic testing of actual production parts and certain supplied parts. A constant control over finishing materials, processes, and the finish of the completed product is thus maintained.

The Dependability of Future Lead Supplies. A twelve-page leaflet, colored and well illustrated is available from Lead Industries Association, 420 Lexington Avenue, New York 17, New York, to help users of lead and lead products. The booklet, answers with reassuring facts and pictorial charts, some of the misleading statements made about lead supplies and reserves.

The Effect of Copper Undercoats on the Protective Value of Nickel-Chromium Coatings on Steel. The International Nickel Co., Inc., Dept. EZ, New York 5, N. Y. now has available a 12-page, well illustrated and documented reprint which gives the results of an 18 month study on high carbon steel panels plated with nickel-chromium and with copper-nickel-chromium coatings and subjected to various atmospheric and accelerated exposure tests.

Corrosion-Resistant Equipment. A 64-page extensive catalog of all equipment made by Haveg Corporation, Marshallton, Delaware, which is molded from a mixture of acid digested asbestos and synthetic resin has been made available. The bulletin gives grades of material, chemical resistance, electrical properties, standard pipes and fittings, with dimensions and illustrations. Valves and pumps, fume ducts, tanks, towers, pressure and vacuum equipment, filters, accessories, agitators, agers and other equipment made by the corporation are included.

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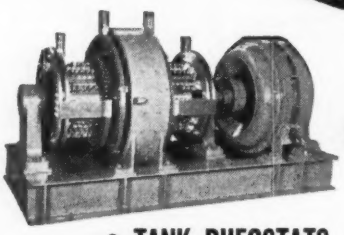

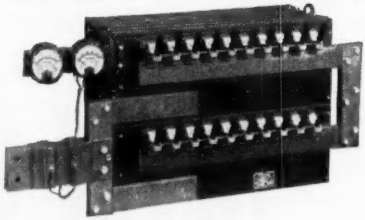

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High Temperature Ceramic Coatings For Chemical Use

W. A. Barrows

By W. A. BARROWS

President, Barrows Porcelain Enamel Company
Cincinnati, Ohio

IMPORTANT advances have been made in the porcelain enamel industry during the past two decades. During the twenties and early thirties, the application of porcelain enamel to household appliances commanded a great part of the research and development efforts of the industry, eventually reaching their present position as widely accepted appliance coatings. The various characteristics of these coatings became common knowledge.

However, recent research, prompted in great part by the jet-engine program, has resulted in new techniques and, so to speak, a completely new group of porcelain enamel coatings. There are strong indications that these new coatings will be valuable aids to the solution of corrosion and heat problems.

Clarification and delineation of the characteristics of these new coatings are important to engineers anxious to suggest equipment that will have such vital features as low cost, long life, and ease of maintenance.

It is important to note that there are hundreds of different ceramic coatings. The selection of the proper coating depends on its end use. Prolonged operation under high temperature and the application of high stresses will require the selection of the proper base metal as well as the proper coating. Acid resistance, dielectric characteristics, and resistance to thermal shock also are important factors for consideration, their importance varying with use conditions. However, despite the impossibility of declaring that these finishes will have certain characteristics under any and all operating conditions, it is possible to discuss the generally accepted features of ceramic coatings which will serve as a guide.

The raw materials for ceramic coatings are widely available. Therefore, cost and supply problems, which confront design engineers more and more during these days of scarce and expensive metals and alloys, are considerably lessened when these coatings are used. Almost any ceramic coating can be

supplied readily at a relatively low cost. However, even when expensive frit mixtures are used, their use is justified, because coatings of these frits are applied in thin films and have increased tremendously the life of parts on which they have been applied. At the same time, they have reduced maintenance costs. The coatings prepared from the lower cost frits have proven to be good materials because of their competitive price position and other desirable characteristics.

Basically, the new high temperature ceramic coatings are, as the name implies, coatings designed to withstand substantially higher temperatures than ordinary porcelain enamels. Whereas ordinary porcelain enamels are limited to sustained use at temperatures of less than 1,000 deg. F., the high temperature ceramic coatings generally can be used at temperatures of 1,600 to 1,800 deg. F. for long periods of time, corrosion and mechanical factors being normal.

Normal weather does not cause corrosion of metal parts coated with these ceramic coatings. Inasmuch as the coatings completely cover the metal parts, and as they have high corrosion-resistance qualities, the possibility of destruction of parts under atmospheric conditions is remote.

Acids and alkalies present a particular corrosion problem which requires additional consideration. It can be stated generally that there are two groups of porcelain enamels and ceramic coatings: (1) regular, which are suitable for use only under normal atmospheric conditions and can thus be used with solutions that are normally free from acids and alkalies, and (2) acid resistant, which are resistant to most acids except hydrofluoric acid.

As an example of ceramic resistance characteristics, Solaramic — a special ceramic coating—will withstand reducing and oxidizing atmospheres and is reasonably resistant to chlorine, sulfur dioxide or trioxide, carbon dioxide, and vanadium gases. Samples of Solaramic 52-10 on acid and alkali tests showed 0.0005 grams per sq. in. loss in 6 per cent citric solution at boiling temperature for 2½ hours. Loss of 0.0007 grams per sq. in. in 5 per cent pyro solution at boiling temperature for 2½ hours was experienced.

Fig. 1—This heat diffusing section is for use in a high temperature furnace. Coated with porcelain enamel, the cone, shown here in two sections, is a good example of the large pieces which can be coated with porcelain enamel. The protective porcelain enamel was applied by the Barrows Porcelain Enamel Company.

The problem of alkali resistance of porcelain enamels is somewhat similar to that of acid resistance. It can be stated generally that ceramic coatings are resistant to mild alkalies and detergent solutions.

It is important that design engineers be familiar with certain other factors, particularly those concerned with the characteristics of the metal to which

the ceramic coating is to be applied. For example, it should be noted that porcelain enamel can be most easily applied to enameling iron and cast iron. Cold rolled steel provides the next best base. The new high temperature ceramic coatings, on the other hand, are designed for use on stainless steels and can be applied to any of the common stainless steels, including straight chrome stainless. However, one of the new high temperature coatings is designed for use on the 1010 steels and will greatly improve the heat resistance of cold rolled steel. Generally, non-ferrous metals do not form a good base for the application of porcelain enamel or ceramic coatings.

Porcelain enamel and ceramic coatings both can be applied according to strict tolerances. If necessary, tolerances of a few thousandths of an inch can be held. Ordinary coatings run from 0.005 to 0.03 inch. High temperature coatings are generally applied at a thickness of 0.001 to 0.0015 inch.

The mechanical impact which various porcelain enamel and ceramic coatings can withstand is extremely high, and it can be stated as a rule of thumb that the coatings will adhere to a metal up to the yield point of the metal.

The coefficient of expansion of brazing materials and the low melting point of solder makes them impractical for coating with ceramic coatings. At the same time, it should be noted that pieces of uneven thicknesses are less desirable for coating; pieces of non-uniform thickness result in non-uniform heat penetration during fusing of the glass.

In summary, four factors should be considered for successful ceramic coat-

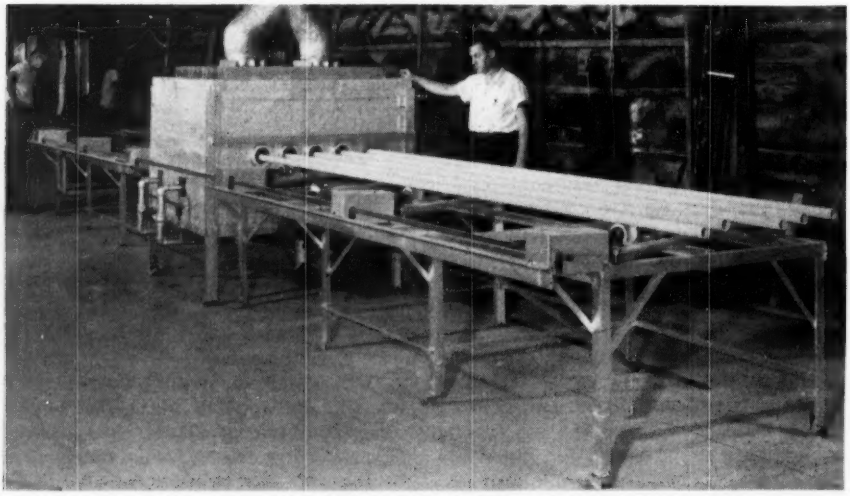

Fig. 2—This continuous porcelain enamel fusing furnace, developed by the Barrows Porcelain Enamel Company, illustrates the special processing equipment in use in the porcelain enamel industry. The furnace was designed and built by Barrows to fuse both the inside and the outside of different sizes of pipe at the same time. It has solved several handling problems and improved quality. Prime advantage of the new furnace is the elimination of handling marks on the pipe. The pipes are first coated with liquid porcelain enamel, or "slip," dried, and placed on rollers adjacent to the furnace which advance the pipe at a uniform rate of speed. Rollers are set at an angle to the direction of travel. The slow, continuous rotation and forward movement of the pipe gives the enamel enough time to fuse to the pipe for a uniform coating.

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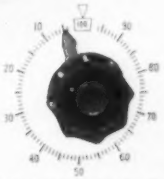

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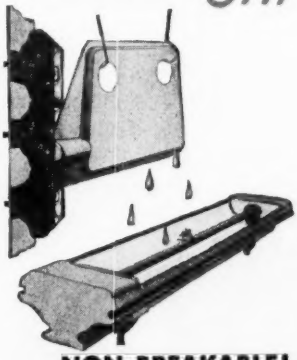

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Fig. 3 — Interior and exterior coating of this burner unit with porcelain enamel by the Barrows Porcelain Enamel Company solved two problems inherent in the use of this product. Condensation caused dilute sulfuric acid to form along the sides of the burner when idle, causing deterioration. The acid-resisting porcelain enamel eliminated this problem. Operation of the burner at high temperature caused further deterioration, and the high heat resistance of the coating similarly eliminated the problem.

ings: base metal, type of coating, design, and fabrication.

Intensified research in recent years has shown conclusively that porcelain enamel and ceramic coated parts will be an increasingly important factor of future chemical design. Investigation of strength, heat and wear resistance, acid resistance, and electrical properties of ceramics has resulted in development of various finishes that can profitably be used in industry.

Porcelain enamel and ceramic coatings are being used today as coatings of chemical processing vats, acid storage tanks, brine tanks, chemical piping, and smoke stacks.

Present day use of these coatings represents only a small part of the potential applications. The unusually high heat resistance of the new group of porcelain enamels combined with their high corrosion resistance opens numerous uses for these coatings.

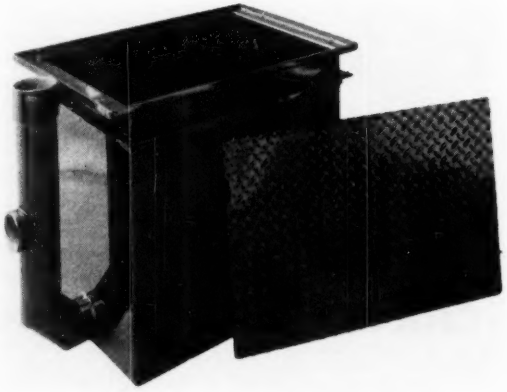

Fig. 4—Coated with solid acid resisting black glass porcelain enamel, this grease trap is designed to separate grease from septic systems of hospitals, office buildings, schools. Coated on both the inside and the outside, the trap can be cleaned with solvents that could not normally be used on other surfaces.

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The "Why" of Modern Polishing Abrasives

By HENRY R. POWER

THE slave whetting a knife, represented by the statue in a Florence museum, probably used emery, since this is one of the earliest known materials, and his good judgment is confirmed by the continued though shrinking mining and use of emery to this day. However, the several properties desirable in a modern abrasive are all found in the manufactured product, since it can be made to order, without the deficiencies of natural products made by Mother Nature. These properties are: extreme toughness and hardness; uniformity of crystal structure and chemical composition; proper sizing and shaping, with capillarity and surface tenacity regulated for proper bonding with glue adhesive. The present day electrically fused alumina possesses the foregoing properties.

Emery varies in composition, but in general may be said to consist of crystals of aluminum oxide embedded in a matrix of iron oxide. The crystals vary in size but in all cases they are very small, so that in any individual granule there are a number of crystals together with the matrix. Such a product has limitations when used in modern polishing shops.

Through technical control of the electric furnace operations wherein the mineral bauxite is purified, and the purified product crystallized, a "tailor-made" abrasive results. Fused aluminum oxide is of extreme hardness. Hardness may be defined as the limit of resistance which molecules offer to change in their relative positions. A simple method of expressing it is that of the mineralogist using the scale of Moh, wherein Talc is No. 1 and Diamond No. 10. In this scratch hardness system, diamond scratches all other known materials hence is the ultimate in hardness. Somewhat less than diamond is fused alumina or about 9 in the Moh scale. It is evident that since fused alumina is used to finish metals and other hard substances that it must have a hardness superior to them.

Extreme toughness or impact strength is another characteristic of fused alumina abrasive, and this can be controlled by the furnace practice and type of feed. For instance, alkali in the mix fed to the furnace gives a slightly weaker abrasive that has specific uses in finishing metals.

Uniform chemical composition in the electric furnace product can be maintained within closer limits than is exhibited by natural abrasives. Chemical control definitely is concerned with crystal size. Rapid cooling of the furnace mass also varies crystal size. Smaller sizes of the crystal act weaker, a desirable quality in certain commercial uses. Conversely, proper furnace control can yield crystals of large

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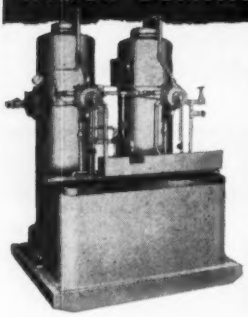

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Cost analyses are proving that the use of raw water in metal coating processes is not so cheap after all. This is especially true when mineral-free water can be obtained for a matter of cents per 1000 gallons in any quality with an INDUSTRIAL water demineralizer.

The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed—keeping space requirements at a minimum.

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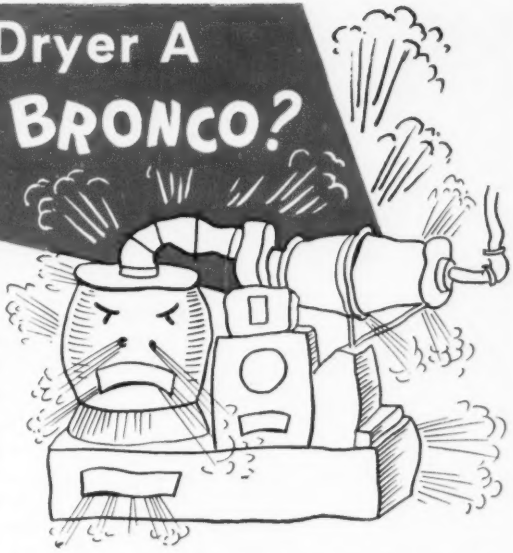
size, up to 2 inches in diameter, which are very desirable for heavy duty applications. Because hardness, toughness, chemical composition and crystal structure can be predetermined the modern fused alumina abrasive is technically "tailor-made."

The lump of abrasive from the electric furnace is reduced in mills and crushers specially adapted for the purpose of controlling the shape of the resulting granule, so that slivers and flats of doubtful economical life are eliminated, yet the sharp cutting edges on solid grains are retained. Shapes are varied according to the specific nature of the polishing operation. For a roughing operation a different shape may be required than that used in a finishing operation on the same metal. Again, for different metals, different grain characteristics may be required.

The sifting operations employed by the electric furnace abrasive maker are unique in producing closely graded sizes, so that there are no oversized granules to scratch and mar the finish, and no undersized grains which fail to do their share of the work and slow up production. The silk bolting cloth with which the sieving machines are dressed must meet rigid specifications of aperature size to ensure the quality of the abrasive passing through them. The commercial sizes are checked against master grain samples to further make certain that the product is ready for the polisher.

All of the properties discussed are a total loss to the polisher if the abrasive does not adhere to the polishing wheel until it has completed its work. Shedding can be excessive if the abrasive is exposed by accident to oily or greasy vapors prior to use, hence care must be exercised in its handling in the shop. This carelessness can offset even the specific adhesion value called "surface tenacity" which has been built into the abrasive by the manu-

Is Your Dryer A BUCKING BRONCO?



In order for a centrifugal dryer to stay put it should be heavy. That's why the modern Nobles Dryer is about twice the weight of most dryers. Extra weight is one of the reasons for its stability, its freedom from vibration, its smooth operation, and long trouble-free life.

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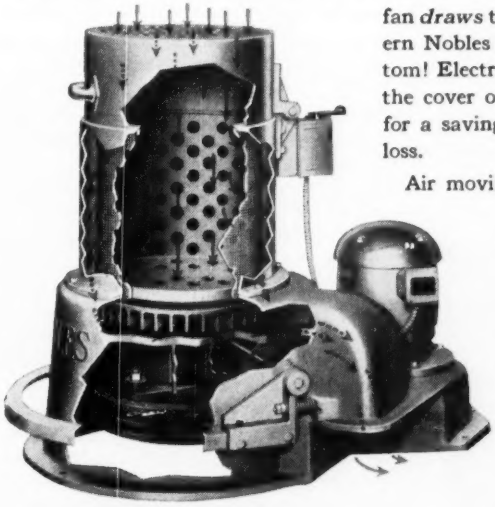

Air moving equipment isn't an extra. The powerful suction fan is an integral design feature of each machine. A brake pedal extending around the entire work area controls an internal, expanding hydraulic brake for quick, smooth stops.

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facturer. This property has much merit because surface tenacity means ready wetting of every granule with glue, quickly attaching to the wheel periphery, and best of all, strong adherence when the glue adhesive has set.

This results in maximum life of the flexible grinding wheel in the operation called polishing.

Flame-Plating Protects Parts From Wear

FLAME-PLATING is a new method for applying hard, thin, precise coatings of powdered metals, such as tungsten carbide, on metal parts. It is being used to help solve frictional and abrasive wear problems—no matter how common or how unusual the problem may be. Flame-Plating was developed by Linde Air Products Company, 30 E. 42nd St., New York 17, N. Y., a Division of Union Carbide and Carbon Corporation.

Extensive tests to date indicate that flame-plated tungsten carbide coatings have the desirable properties of sintered tungsten carbide, while at the same time avoiding some of the limitations of the sintered form. Tests have shown that the coatings have wear and abrasion resistance that is as good as, or better than, sintered carbide. Although several coating materials are being tested for use with the flame-plating process, much of the initial work has been done with tungsten carbide, and all present commercial applications use this material.

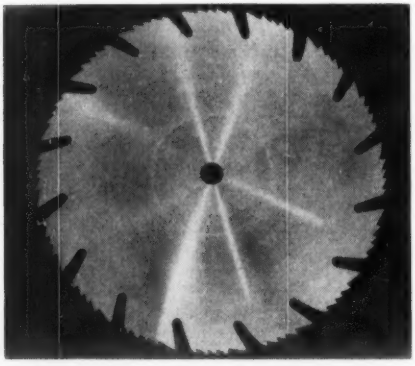

Fig. 1—The teeth of this ten-inch circular saw blade have been flame-plated to help them keep their "bite" longer. For this application, no grinding or polishing of the coating is necessary.

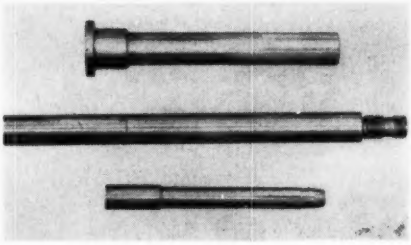

Fig. 2—Core rods must resist severe abrasion and be tough enough to withstand a certain amount of loading and deformation. A hard coating of flame-plated tungsten carbide over a strong steel base provides the ideal combination of properties for this application.

One of the biggest features of this new method is that the temperature of the base metal does not exceed 400 deg. F. during the plating operation. This low-temperature deposition practically eliminates any possibility of a change in the properties of the part being plated, and reduces to a minimum the chance that the part might warp.

The bond between the base metal and the coating is mechanical—it is not a welded bond. Because of the unique way in which the coating is applied, there is no mixing of the coating with the base metal.

Adaptability of Process

Flame-plating is adaptable to many different base metals in a wide variety of sizes and shapes. Steels, cast iron, aluminum, copper, brass, bronze, titanium, and magnesium have all been suc-

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cessfully coated. Flat areas, cylinders, spheres, internal areas, and many irregular shapes have been coated. Tungsten carbide coatings from 0.0005 to 0.020 inch thick are currently being applied. Flame-plated coatings are available for literally hundreds of applications—precision tools and gages, well-drilling equipment, engine shafts and bearings, cotton-picking spindles, and many others.

When any metal part is flame-plated, the base metal retains its properties. If copper is flame-plated, it has good electrical conductivity; but, at the same time, it resists surface wear. If magnesium or aluminum is flame-plated with tungsten carbide, a lightweight part is produced that has wear resistance equal —or superior—to sintered tungsten carbide. Flame-plated steel parts are tough enough and strong enough to withstand loading and have excellent resistance to severe frictional and abrasive wear.

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Preparing and Finishing Parts

Parts to be flame-plated are undercut just deep enough to allow for the desired thickness of the coating. A small protective lip of base metal is usually left at any sharp edge where the part may be subjected to abuse or where two flame-plated surfaces meet at a sharp angle.

After a coating is applied, it can be ground and lapped to a finish of approximately 2 microinches rms. Finish specifications are determined by the requirements of the part. Some applications, such as the teeth of a circular saw blade or the barbs of a cotton-picking spindle, do not require any grinding. The surface finish of as-coated tungsten carbide applied by flame-plating is approximately 125 microinches rms.

Resinoid bonded diamond wheels are the only grinding wheels suitable for finishing a flame-plated surface. A 100-mesh wheel is used for rough-grinding and a 400-mesh wheel for finish-grinding when no more than 0.005 in. is to be removed. Before and during grinding, the part is flooded with a suitable coolant.

All commercial flame-plating is done at the Speedway Laboratories of Linde Air Products Company, Indianapolis, Indiana. Parts are prepared by the customer, sent to Speedway for coating, and returned to the customer. If the parts require finish grinding, the customer has this work done. As the demand for flame-plated coatings grows, Linde will establish additional facilities for doing flame-plating in varous parts of the country.

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

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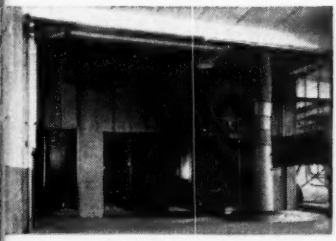
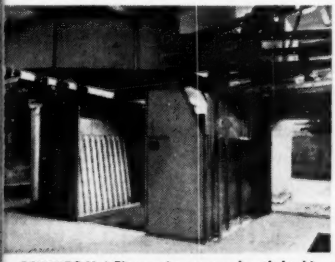
Schmieg Complete FINISHING SYSTEMS

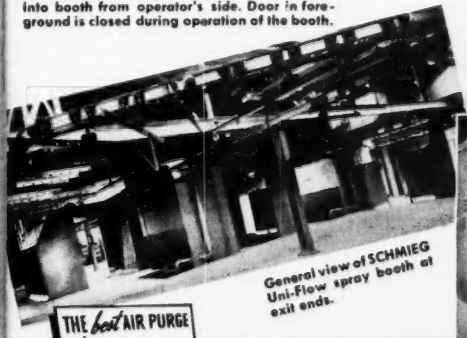
These photographs of SCHMIEG finishing equipment recently installed in the ultra-modern plant of a large manufacturer of kitchen equipment and other metal specialty items.



Above is SCHMIEG air supply equipment located in the building penthouse. During operation, doors in equipment enclosure are closed. Stack and fan is one of five stacks from spray booths on the floor below.



SCHMIEG Uni-Flow prime spray booth looking into booth from operator's side. Door in foreground is closed during operation of the booth.



General view of SCHMIEG Uni-Flow spray booth at exit ends.

ask the Engineers...

Why SCHMIEG Finishing Systems give best performance per dollar invested.

It's no secret that design experience and engineering skill have put SCHMIEG out in front, where careful planning and reasons of economy are most necessary for specific plant installations.

SCHMIEG Uni-Flow SPRAY BOOTHS offer important advantages in space saving and operating economy.

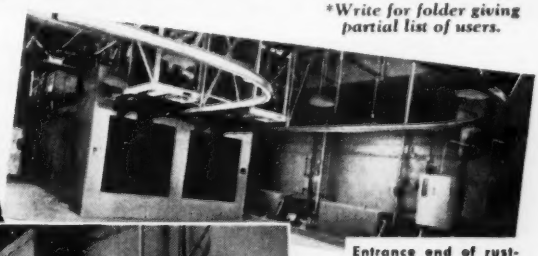
SCHMIEG Industrial OVENS are recommended by engineers who know, for hundreds of uses that save dollars in plant operations.

So also the SCHMEIG mesh-belt, conveyor type WASHERS, and the automatic circular types which time, index and rotate parts through wash, rinse and blow-off steps—operated by a single worker.

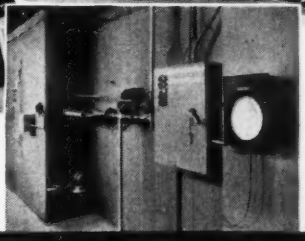
For the very best aids to efficient, money-saving industrial operations, ask the engineers who know*—about SCHMIEG. Then call in *our* engineers to design units ideally suited to your specific needs.

SCHMIEG Centri-Merge dust and fume elimination units have been acclaimed as the best solution to the problem of removing dust and fumes, in any industrial application.

**Write for folder giving partial list of users.*



Entrance end of rust-proofing machine. Exit end of prime and finish ovens. Note pusher conveyors to convey work through ovens.



External view of Dry-off oven. Direct fired heating equipment and circulating fans are located in offset section of oven. All controls are in panel in foreground.

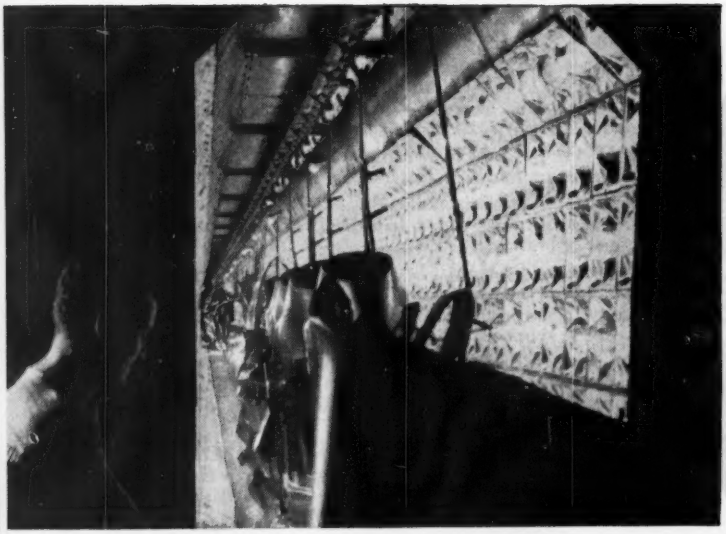
THE *best* AIR PURGE *is* CENTRI⊙MERGE

Schmieg INDUSTRIES INC.

Engineers & Manufacturers

P. O. BOX [illegible] DETROIT 32, MICHIGAN

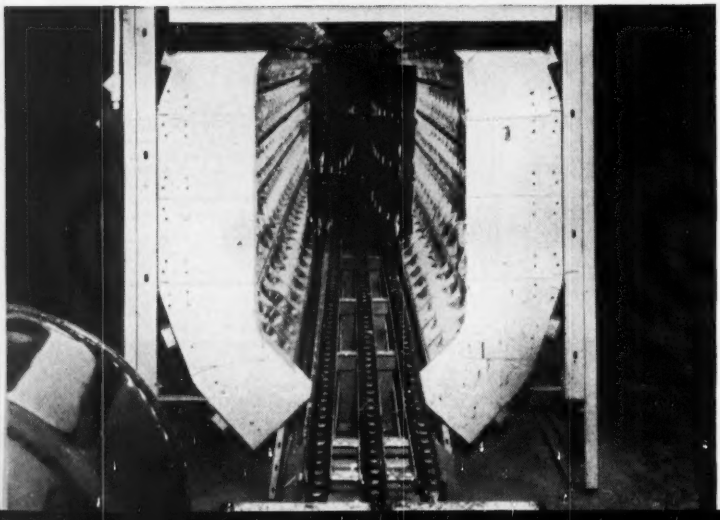
PLANTS BY THE THOUSANDS *Switch to*



TYPICAL EXAMPLES OF FOSTORIA ADVANTAGES

Studebaker, Canada has 7 Fostoria ovens used for Bonderite, prime and finish coat drying of bodies and parts. Time is about half formerly needed. Maintenance reduced 75% over older methods. Finishes improved by penetration of heat through paint film. Cleanliness has practically eliminated rejects and reprocessing.

MOST EFFICIENT OF ALL FINISH BAKING OVENS



This Fostoria oven at Canadian Oil, Ltd. bakes yellow and white finish on oil and grease drums in 4 minutes. Production of 200-100 lb. grease drums and 100-45 gal. oil drums has been obtained. Starting section of oven has 500 W lamps. Balance of oven has 500 W lamps top and bottom rows and 250 W lamps in remainder.

FOSTORIA OVENS

For FINEST FINISH QUALITY

Lowest "Per Piece" Production Cost

UNEQUALLED LOW-COST ADVANTAGES

1 LOWEST OPERATING COST
Puts heat into the product — not into oven walls. Uses less fuel. Gold plated interior reduces heat loss to 2%.

2 REQUIRES LESS FLOOR SPACE
Shorter Cycles — most production for oven size. May be ceiling mounted:

3 FASTEST PRODUCTION
Fastest means of heat transfer. No warm-up required — no shut-off lag. Heat levels instantly changeable.

4 LOWEST MAINTENANCE COST
Clean operation — no combustion by-products. Lowest source replacement cost.

5 COMFORTABLE WORKING CONDITIONS
No room ventilation problem.

6 COMPETITIVE INITIAL COST
Comparable to any quality-built oven.

UNEQUALLED QUALITY ADVANTAGES

1 SMOOTH "FLOW-OUT" OF PAINT
Uniformity of heat distribution and rapidity of solvent removal give smooth, even paint film.

2 THOROUGH UNIFORM BAKE
Near Infra-red energy penetrates paint film with constant uniform temperature.

3 CLEAN FINISH
No by-product of combustion — no condensation of solvent volatiles to mar finish.

4 SAFETY CONTROLLED
Instant heat shut-off with conveyor stoppage. No over-baking by shut-off lag.

Write for brochure of technical facts on Infra-red and case histories of many Fostoria oven installations. Tell us about your particular problem and we will include data directly applicable to your operations.

FOSTORIA PUTS HEAT INTO THE PRODUCT — NOT IN THE OVEN WALLS

INFRA-RED fostoria OVENS

Send for Complete Facts

THE FOSTORIA PRESSED STEEL CORP.
FOSTORIA, OHIO, Dept. IP

Please send information on Infra-red ovens for

.....

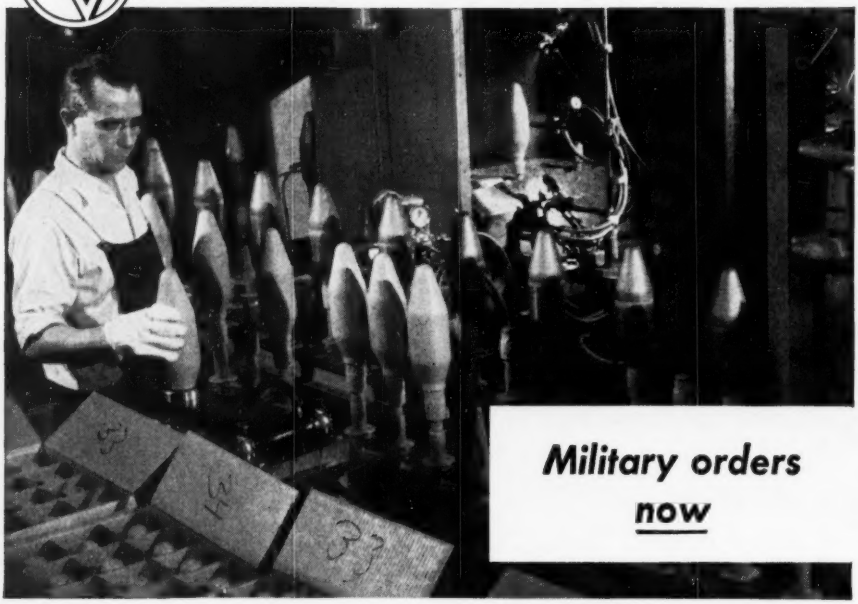
Name .....

Company .....

Street .....

City ..... State .....

DeVilbiss Automatic Spray



Bazooka shell assemblies get their protective finish with DeVilbiss chain-on-edge type spray equipment.

There's an advantage in using DeVilbiss Automatic Spray Equipment you may not have thought of. Besides helping you to produce defense orders at a profit, these machines can be adapted to the finishing of civilian goods generally by only changing work holders, adjusting gun positions and timing.

Then, when you switch from defense work to your regular line of products, you'll continue to save as much as 50% on time, labor and material costs—many times the cost of the automatic equipment.

Models to Fit Your Needs

DeVilbiss chain-on-edge machines coat both inside and outside of 300 to 1650 pieces per hour depending on the job. Rotary type machines are capable of as many as 5400 pieces per hour. Vertical and horizontal transverse machines spray flat products in sheet, roll or

BRANCH OFFICES AND DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE

Machines do double duty:

Vacuum cleaner housings get two-coat, hammered-metal finish on a machine similar to the one at the left.

panel form at the rate of 3000 to 14000 square feet per hour.

Let Us Help You

A DeVilbiss representative will gladly give you information on all types of spray finishing equipment—spray booths, spray guns, air compressors, hose and connections, as well as automatic machines. He will tailor the equipment into a balanced setup geared to your finishing operations. Isn't it worth a call or a letter?

THE DEVILBISS COMPANY
Toledo, Ohio
Windsor, Ontario • London, England
Santa Clara, Calif.

FOR BETTER SERVICE, BUY
DEVILBISS

UNITED STATES, CANADA AND THE WORLD

Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question: *In your July, 1952 issue of PRODUCTS FINISHING pertaining to the article "Nikon Finishing Methods Stress Quality," you mention a bright dip for aluminum (page 34) and a bright dip for brass. If possible, I would appreciate both formulas with details as to time, concentration, and temperature of both of these baths.*

A. A. L.

Answer: There has been some difficulty in securing the information concerning the bright dips mentioned in our article, "Nikon Finishing Methods Stress Quality," in the July, 1952 issue of PRODUCTS FINISHING. Generally, however, the bright dip for aluminum is a mixture of seven volumes of concentrated phosphoric acid, two volumes of concentrated nitric acid and one volume of water. A wetting agent known as Aerosol or Triton X-100 is added in the amount of 0.1 to 0.5 per cent. The time of the dipping operation is 30 seconds or less.

The solution used to bright dip brass is quite similar except that carbon black is added just as it is in brass bright dipping practice in the United States. For bright dipping brass two solutions are used in the interest of acid conservation. Again, the dipping time is quite short; less than one minute in each solution.

fc

Question. *We are manufacturers of aluminum wire and sheet metal products, and aluminum nails, used primarily for exposed or outside work such as wood siding, asbestos siding, and so on.*

We are endeavoring to locate a proc-

ess for coloring these aluminum nails in order that they will match the colors used for the various siding materials—colors such as brown, green, cream, tan, and so on. Please advise us how we may set up such a process in our plant.

L. E. B.

Answer. Aluminum may be colored by three general methods. The first is by electrolytic anodizing in sulfuric acid, followed by dipping in dye solutions, and finally by sealing in boiling water.

A new process of treating the surface of aluminum to form oxide coating and coloring the surface in one operation has just been announced, and you might like to investigate that method, since it would appear to be simpler from a process standpoint.

A third method of coloring aluminum involves a surface conversion dip, followed by spraying or tumbling in special metal lacquer to secure the color desired.

We are referring you to the many companies marketing the products and solutions suggested above.

fc

Question. *For many years now we have been using solid brass embossed channel in the production of a line of metal photo frames. The procedure employed was to bright dip the brass frames and then lacquer them to produce an acceptable finish on the products. Due to the shortage of brass or copper, we have been forced to turn to steel as the metal from which to make picture frames.*

Our problem is to brass plate the steel channel to duplicate the lustrous finish previously obtained in the manner described. Naturally costs must be kept to a minimum, and rusting of the finished product prevented.

L. T.

Answer. One way to approach your problem is to brass plate a sufficient length of time so that the normal bright dip could be employed after brass plating. It will be necessary for you to experiment to determine this time exactly.

Another finishing system which might be satisfactory would be the treatment of the steel with a phosphate or chromate corrosion-resistant coating, followed by the application of a metallic lacquer of the shade and brilliance desired in your product. We are listing the names of a number of companies that supply material which you could use in the second suggested solution to your problem (nine companies listed).

fc

Question. *I am operating a small plating shop and wish to replate a number of old silver pieces. These products are plated over Brittania base metal, and are covered with a hard, black scale. Can you advise me how to remove this hard scale?*

C. O. L.

Answer. We are sending you tear sheets of an article published several years ago in PRODUCTS FINISHING. The information in this article, "Repairing and Silver Plating Valuable Antiques", was supplied by John H. Feeley, who has been plating silver for a number of years.

DO YOU HAVE A FINISHING PROBLEM?

The editorial staff of PRODUCTS FINISHING is prepared to aid you in the solution of your problem.

There is no charge for this service.

Spotlighting FINISHING Progress

Chromium Plating Methods

IN addition to its well known decorative applications, electrodeposited chromium has properties that make it valuable in a number of strictly engineering applications. Chromium is harder than any other commercially plated metal. Other properties that are of particular benefit in connection with its engineering uses are its low coefficient of friction and non-galling properties, and its good resistance to corrosion at both ordinary and elevated temperatures.

In discussing problems of chromium plating for engineering uses, commonly known as "hard chromium" before the Boston Branch, American Electroplaters' Society, Arthur W. Logozzo, Nutmeg Chrome Corp., emphasized the importance of proper stress relief to the success of the plating operation. One practice recommended was to use a bake prior to plating to stress relieve final grinding, and a bake after plating to remove occluded hydrogen. In the case of cutting tools, additional life ranging from two to ten times the normal life of unplated tools has been obtained, when the proper stress relief and plating procedures are used. The practice of stress relieving after grinding and after plating has greatly enhanced the life of plated gages from a cracking and breaking standpoint.

The cycle shown below has been used for

By DR. ALLEN G. GRAY

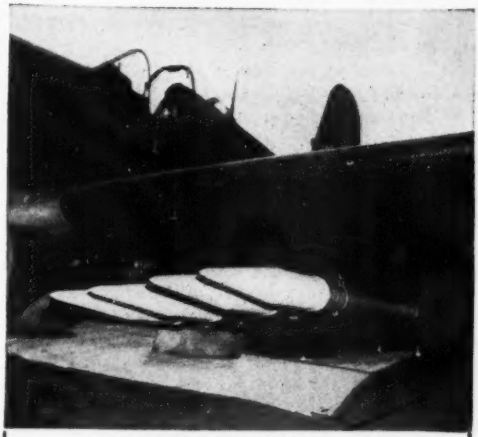
A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: IMPROVING PAINT ADHESION ON STEEL WITH GRANODINE®

INTRODUCTION:

"Granodine" is a zinc phosphate coating chemical which improves paint adhesion on steel, iron and zinc surfaces. In the easily applied Granodizing process, a non-metallic crystalline coating is formed on the treated metal. This bond holds and protects the paint finish and thus preserves the metal underneath. Parts can be either Spray Granodized in an industrial power washing machine, Dip Granodized in tanks, or Brush Granodized with hand equipment.



Official Dept. of Defense Photograph

An F4U Corsair with the Navy's new aircraft anti-tank rocket, the "RAM". A Grade I zinc phosphate finish (JAN-C-490) protects the entire external surface of this rocket and provides a durable bond for the specification paint finish.

"GRANODINE" MEETS SERVICE SPECIFICATIONS:

The protective "Granodine" finish meets Grade I of JAN-C-490 and equivalent requirements of:

JAN-F-495 U.S.A. 57-0-2C, Type II, Class C U.S.A. 51-70-1, Finish 22.02, Class C.

MANY APPLICATIONS:

Automobile bodies and sheet metal parts, refrigerators, washing machines, cabinets, etc.; projectiles, rockets, bombs, tanks, trucks, jeeps, containers for small arms, cartridge tanks, 5-gallon gasoline containers, vehicular sheet metal, steel drums and, in general, products constructed of cold-rolled steel in large and continuous production are typical of the many products whose paint finish is protected by "Granodine" zinc phosphate coating.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "GRANODINE" AND YOUR OWN METAL PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

plating cutting tools at the Nutmeg Chrome Corporation:

1. Heat treat at 600-1200 deg. F., depending on steel and previous treatment.
2. Anodic clean in 12-16 oz./gal. cleaner at 6 volts.
3. Water rinse.
4. Pickle in inhibited 50 per cent hydrochloric acid, at room temperature.
5. Water rinse (thorough).
6. Plate—5 minutes is average time for new tools.
7. Bake at 350 deg. F. for 1-3 hours. Air or oil may be used.

The softer materials, such as plastics, aluminum, brass, unhardened steels, and magnesium all show chromium plating to be advantageous when it is used on taps, drills, and reamers. One reason for this is that the sticking and gumming tendency of these materials are minimized by the chromium which lowers the friction in the flutes. The thickness of the plate should be approximately 0.00005 inch, which is not sufficient to dull the edges, yet is ample for the flutes.

Finishing Gages

Any part that has a wearing surface, in all types of gages, such as plugs, single and double end, snap, thread and ring, can be salvaged and improved by chromium plating. The procedure is to grind about 0.003 inch undersize, plate 0.003 to 0.004 inch oversize, and then grind and lap to size. This will provide a good, hard, low coefficient of friction surface which is reported to extend the gage life from three to seven times the life received prior to plating.

On the subject of new gages, there are two schools of thought: one calls for a light plate of approximately 0.0001 inch and the other calls for a heavier plate, such as is used in gage

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PIONEERS IN ENGINEERING, MANUFACTURE AND INSTALLATION OF

INDUSTRIAL OVENS
SPRAY BOOTHS
PARTS WASHERS
DUST COLLECTORS
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SPEED FINISHING

ALBERT LEA, MINN.

The Greatest Finishing Story Ever Told!

NAME* Leading Automobile Mfr.

SHIPMENTS

DATE	MODEL NO.	SERIAL
8/18/48	DB-2	1234

Initial Order 1 Unit—Re-ordered 27 units since original purchase

NAME* Large Gear & Ball Bearing Mfr.

DATE	MODEL NO.	SERIAL
10/1/48	DB-2	1049

Initial Order 1 Unit—Re-ordered 25 units since original purchase

NAME* Leading Business Machine Mfr.

SHIPMENTS

DATE	MODEL NO.	SERIAL
6/30/52	DB-200	445

Initial Order 1 Unit—Re-ordered 32 units since original purchase

NAME* ading Appliance, Radio & T. V. Mfgr.

DATE	MODEL NO.	SERIAL
12/4/46	DB-8	1096

Initial Order 1 Unit—Re-ordered 36 units since original purchase

NAME* Large Chain & Sprocket Mfgr.

SHIPMENTS

DATE	MODEL NO.	SERIAL
7/28/51	DB-400	259
7/29/51	DB-400	260

Initial Order 2 Units—Re-ordered 24 units since original purchase

NAME* Leading Appliance & Electrical Equip. Mfgr.

DATE	MODEL NO.	SERIAL
1/5/48	DB-2	1172
1/5/48	DB-2	1173
1/5/48	DB-2	1174
1/5/48	DB-2	1175

Initial Order 4 Units—Re-ordered 74 units since original purchase

THESE CARDS FROM OUR FILES TELL THE STORY! Six years ago Almco Supersheen was a new name in the barrel finishing industry. Today it's the world's most complete and *largest selling* line of barrel finishing equipment and materials. Re-orders from large and small manufacturers have made this remarkable growth possible.

Almost all types of metal parts are now being deburred and finished at sensational cost savings with Supersheen Advanced Speed Finishing.

IN A REVIEW OF 10 TYPICAL ALMCO SUPERSHEEN INSTALLATIONS, finishing costs averaged 80.1% less than former methods—from 48% on a threaded cast iron pipe "T"—to a 95% savings on a steel trigger with intricate configurations.

The coupon below will bring you full information about equipment prices, processes and free services.

★ NAME ON REQUEST

FREE — 22 PAGE BOOKLET
NEW REVISED EDITION

This 22-page booklet is guaranteed to open your eyes! The inside story of Advanced Barrel Finishing as never told before! Shows why Almco SUPERSHEEN Equipment pays for itself in as little as two months! A single-unit replaces from 2 to 12 men. Savings up to 95% on almost ALL types of parts with absolute uniformity, fewer rejects, finer finishes!

Send coupon today for your *FREE* copy.

ALMCO SUPERSHEEN
Dep't. A-2, Albert Lea, Minn.

Please send Free Booklet "Advanced Barrel Finishing" equipment catalog, and details about your Free Sample Processing and Free Engineering Service.

Name _____ Title _____

Address _____

City _____ State _____

ALMCO Supersheen SPEED FINISHING

WORLD'S LARGEST SELLING LINE OF BARREL FINISHING EQUIPMENT—MATERIALS AND COMPOUNDS, FREE SAMPLE PROCESSING, FREE ENGINEERING SERVICE

salvage operations discussed above. The light plate method is to lap 0.00005 to 0.0001 inch undersize, plate 0.00015 inch oversize, and then lap to size. This method is particularly desirable on close tolerance gages as the part can be replated with the light plate economically as often as is required. The two grinding operations, necessary for the heavier deposit method such as used in salvage work, are eliminated and the double lapping substituted for the grinding.

Other parts that have a wearing surface can generally be improved by chromium plating. Spindles, shafts, pistons, and machine parts subject to wear or scuffing were at one time plated principally for salvage purposes (see Fig. 1). In many cases these salvaged parts outlasted the originals. The low coefficient of friction of chromium is an important factor in its use on shafting, piston rings, internal combustion engine cylinders, and similar applications. Chromium plating is used to advantage on new parts that are undersize due to errors in machining or grinding. Since hard chromium gives a longer life to the machining elements on which it is used, it can reduce maintenance costs.

Hard chromium is used on a great number of parts for military equipment. Plated gun barrels have a much greater resistance to wear, provide longer service, and retain their accuracy for much longer periods of time. Anti-aircraft as well as other guns have plated mount bearings.

Moving parts of torpedoes are often chromium plated. Such parts include forward and aft propeller shafts and sleeves, spring levers and rudder adjustment rods. Aircraft parts and assemblies including steel bushings, hydraulic pistons, naval aircraft landing and catapult hooks, landing struts, engine cylinders, pistons and brake drums are plated with chromium. A special type of chromium plate known as porous chromium may be used on

to page 66→

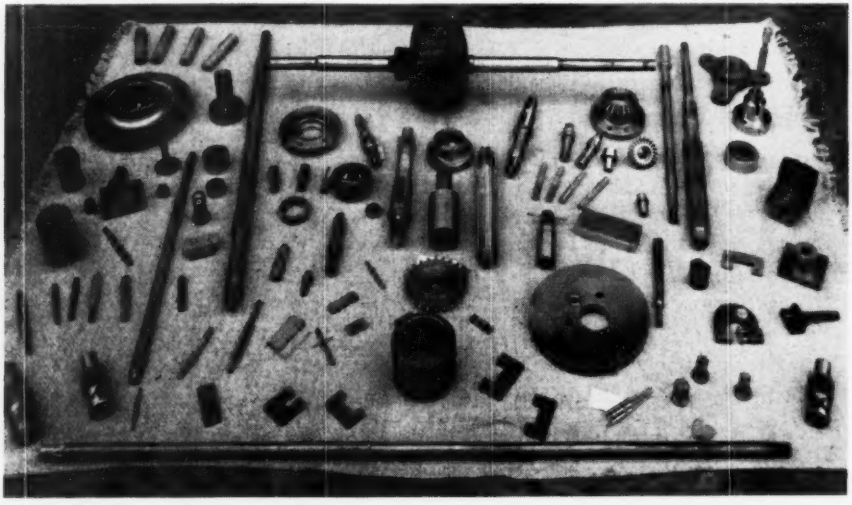

Fig. 1—A collection of miscellaneous parts for salvage by hard chromium plating. (*Photo courtesy Nutmeg Chrome Corp., West Hartford 10, Conn.*)

LOW COST

IRIDITE®

FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide corrosion resistance

paint base

choice of appearance

And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.

LOW MATERIAL AND SHIPPING COSTS

combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS

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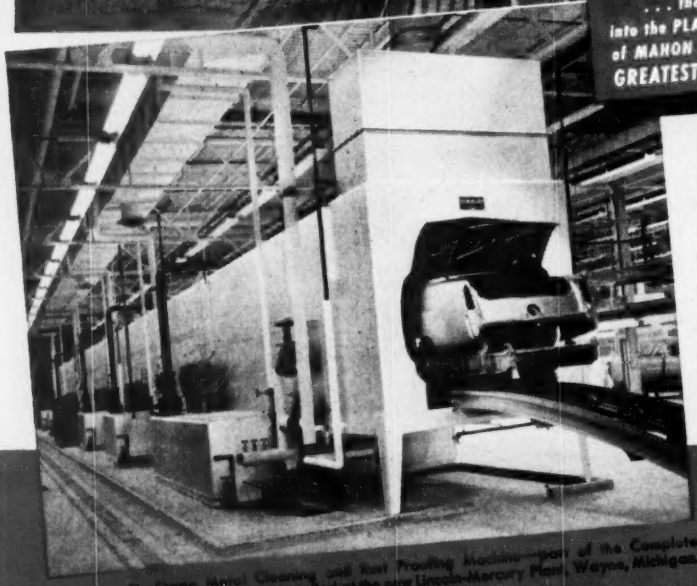
Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Brighteners.

West Coast Warehouse: S. H. BUTCHER COMPANY

COMPLET

. . . the **EXPERIENCE** that goes into the **PLANNING** and **ENGINEERING** of **MAHON EQUIPMENT** is the item of **GREATEST VALUE** to **YOU!**



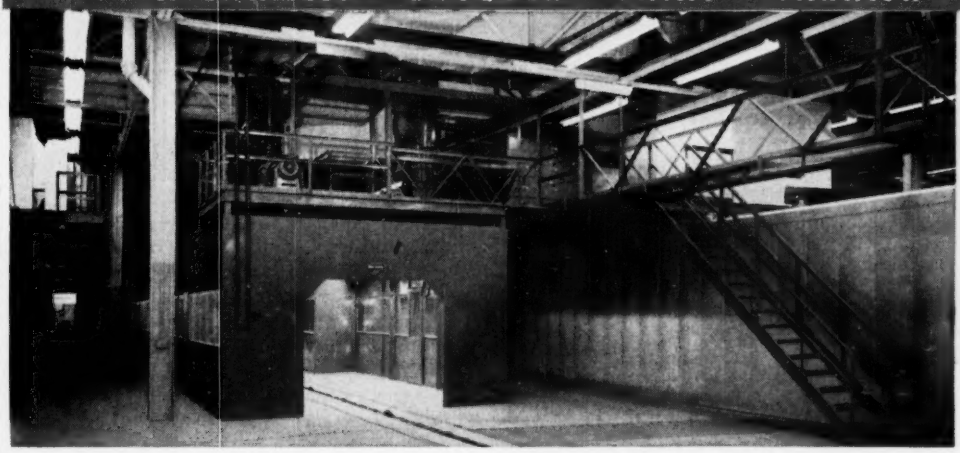
Mahon Six-Stage Metal Cleaning and Rust Proofing Machine—part of the Complete Mahon Body Finishing System installed at the new Lincoln-Mercury Plant, Wayne, Michigan.

Above at right is a partial view of the Complete Mahon Body Finishing System installed in the new Lincoln-Mercury plant, Wayne, Mich. In this view you see the Mahon Vacuum Booth and Tack Rag Booth at the entrance end of the Finish Coat Spray Booth. The Finish Coat Bake Oven is also visible at extreme right. Illustrated above is one of four Mahon Down Draft Hydro-Filter Spray Booths which are also part of the Lincoln-Mercury installation at Wayne, Mich.

M

E Finishing SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH



Complete, Ultramodern MAHON FINISHING SYSTEM Assures FINE BODY FINISH at LINCOLN-MERCURY!

In the new Lincoln-Mercury plant at Wayne, Michigan, the exceptionally fine finish on both Lincoln and Mercury bodies is produced in a complete Mahon Finishing System. The system is ultramodern in every respect . . . included in it are the latest developments in production equipment of this type—all designed to produce greater operating efficiency and to reduce unit cost of finishing to an absolute minimum. The fact that the Mahon Company was selected to engineer, build and install this equipment is significant, yet it is not unusual in the automobile industry . . . because, a survey will show that in the automotive field and the home appliance field, where fine finish is imperative, there are more Mahon Finishing Systems than all other types combined. If you are contemplating new finishing equipment, you, too, will find that Mahon engineers are better qualified to determine your equipment requirements, and to do the all-important planning and engineering which is the key to high quality results in production finishing. Over thirty years of experience in this highly specialized field, coupled with constant research and development, have endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Plant Engineering File for complete information and typical installations in many industries, or write for Catalog No. A-653.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning and Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens; Core Ovens, Heat Treating and Quenching Equipment for Aluminum and Magnesium and other units of Special Production Equipment.

AHON

engine cylinder liners where an oil-retaining surface is desired. Fig. 2 shows aircraft crankshafts set up with auxiliary anodes and masking for hard chromium plating of the bearing journal areas.

Fully annealed chromium metal is soft and the inherent hardness of chromium plate is an important property relating specifically to plating. Using the best known techniques, several investigators have shown that the hardness of bright chromium plate is about 1000 Brinell or Knoop numbers. Softer deposits are usually dull; also, the hardness of the plate may vary depending on plating conditions. As a general rule, conditions of measurement should be given along with plating and after-treatment conditions when hardness of chromium plate is specified. Data available on abrasion resistance show that abrasion resistance parallels hardness for mat or bright plates.

Surface Preparation for Hard Chromium Plating

Another point emphasized, was the importance of proper surface preparation prior to hard chromium plating to ensure optimum adhesion of the deposit. The selection of etching medium and etching time depends on type of basis metal and thickness of plate to be applied. In this connection, Mr. Logozzo referred to data on surface preparation for chromium plating which he presented at the 32nd Annual Convention of the American Electroplaters' Society. Table 1 summarizes these recommendations.

A chromic acid solution of the same concentration as is widely used in plating bath formulations, that is 400 gm./l. chromic acid with no sulfate addition is also employed for etching operations.* Rough ground low carbon steel may need as much as 15 minutes reverse etching to produce a satisfactory surface for smooth heavy chromium deposits. Cast iron should be very lightly etched; a treatment period of 5 seconds is usually satisfactory and should be followed by a high current density strike. The use of a separate tank for etching avoids iron buildup in the plating bath. It is often advisable to arrange for the use of the

* Productivity Report on Metal Finishing by Anglo-American Council on Productivity.

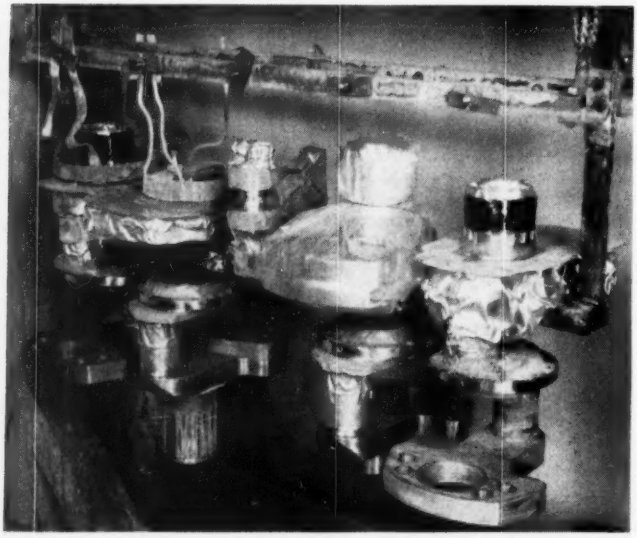


Fig. 2—Aircraft crankshafts set up with auxiliary anodes and masking for hard chromuim plating of the bearing journal areas.

(Photo courtesy Nutmeg Chrome Corp., West Hartford 10, Conn.)

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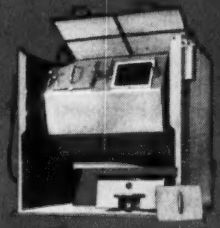

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same tank for both decorative and hard chromium plating. This will assist in keeping the solution in balance by preventing buildup of the trivalent chromium content of the bath which commonly occurs with the use of internal anodes in chromium plating.

Plating Chromium on Chromium

When this is required, factors pertaining to the non-wetting properties of chromium plate must be kept in mind. When wetability is achieved and the work is placed in the tank the current should be built up slowly to the final value. An anodic alkaline treatment until the surface turns slightly milky generally denotes break-down of the non-wetting surface. After rinsing, parts should be treated anodically in chromic acid etch until uniform gassing is observed. They should then be placed in the bath without current for a few minutes, and the current gradually raised to the desired value. Steps involved in plating chromium on chromium are summarized below, as given by Arthur Logozzo before the A.E.S. 32nd Annual Convention.

1. Treat anodically in alkaline bath.
2. Water rinse.
3. Etch anodically in chromic acid until gassing uniformly.
4. Leave in plating tank 5 to 10 minutes with no current.

Table I

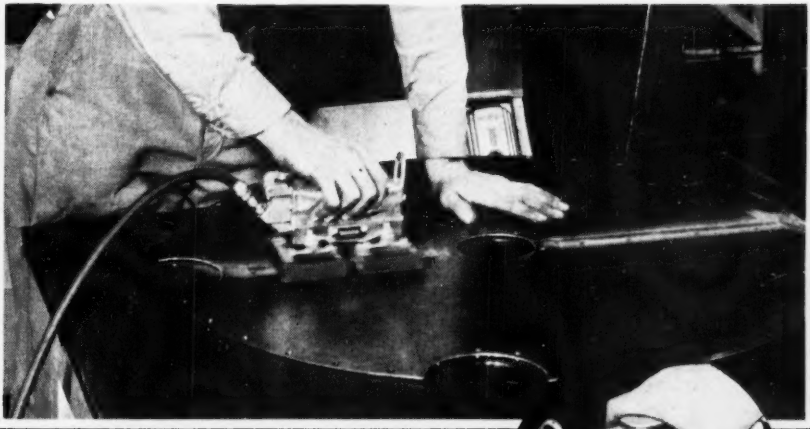
SURFACE PREPARATION FOR HARD CHROMIUM PLATING

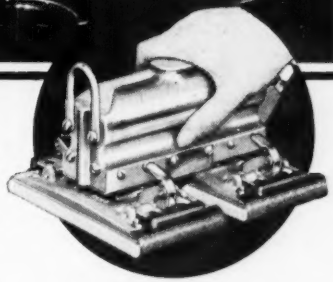
Basis Metal	Alkaline Treatment	Etching Medium	Thickness of Plate	Etching Time
Low carbon steel	Anodic 16 oz./gal. 6 volts	Anodic 28 oz./gal. chromic acid	0.0002" 0.001" 0.005-0.010"	½ - 1 min. 2 - 4 min. 5 - 10 min.
High carbon steel	Anodic 16 oz./gal. 6 volts	Anodic 28 oz./gal. chromic acid	0.0002" 0.001" 0.005-0.010"	15 - 30 sec. 1½ - 3 min. 3 - 5 min.
Moly steel (ordinary)	Anodic 16 oz./gal. 6 volts	Anodic 28 oz./gal. chromic acid	0.0002" 0.001" 0.005"	1 min. 5 - 6 min. 10 - 15 min.
Moly steel (difficult)	Anodic 16 oz./gal. 6 volts	25% sulfuric acid	0.0002" 0.001" 0.005"	½ min. 1 - 2 min. 2 - 3 min.
Nickel-chrome alloys	Immersion soak	Anodic 28 oz./gal. chromic acid	0.0002" 0.001" 0.005-0.010"	½ - 1 min. 2 - 3 min. 5 min.
High speed steel	Immersion clean	Anodic 28 oz./gal.	0.0002" 0.001"	10 - 15 sec. 15 - 30 sec.
Stainless steel	Cathodic clean	Immerse in 10% sulfuric acid prior to anodic etch in chromic acid	0.0002" 0.001" 0.005"	10 - 15 sec. 15 - 30 sec. 1 - 2 min.

Based on data presented at 32nd Annual Convention American Electroplaters' Society.

to page 72→

How to *s-p-e-e-d* de-burring, sanding of sheet metal





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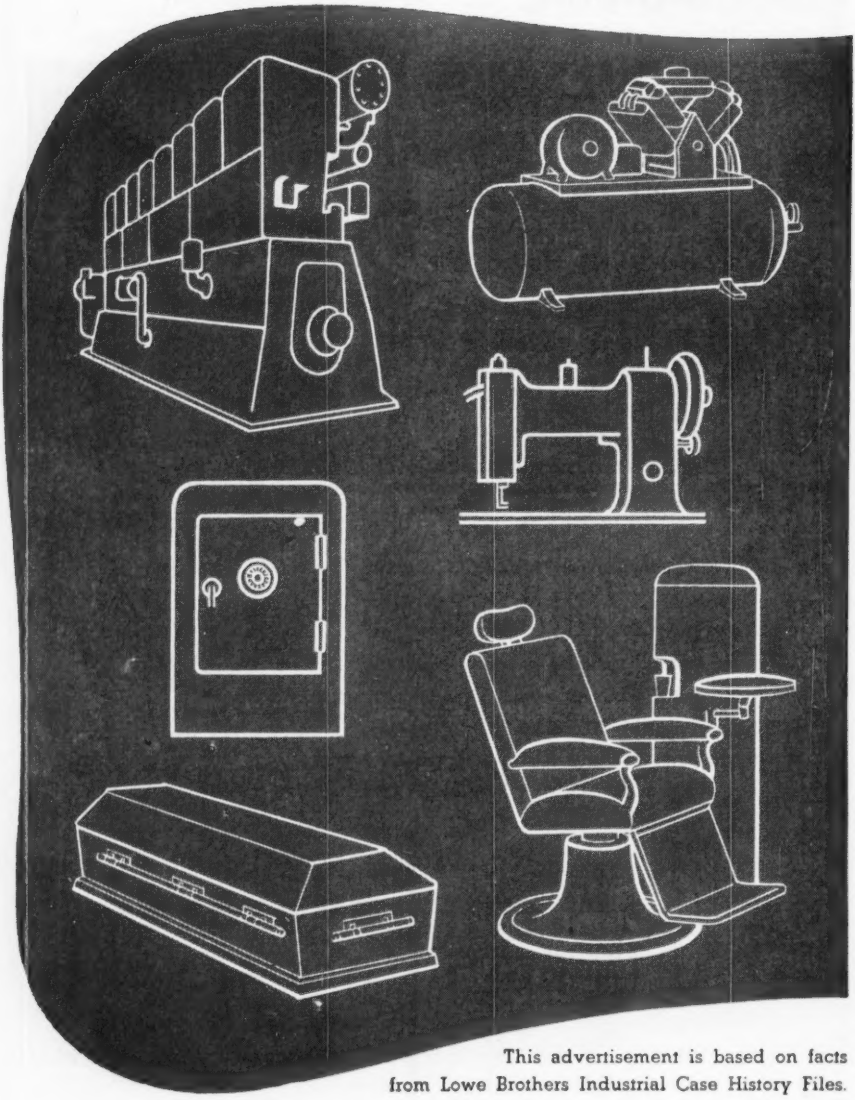

This advertisement is based on facts from Lowe Brothers Industrial Case History Files.

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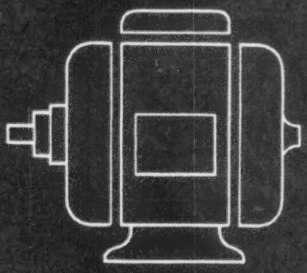

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6. Raise voltage slowly to desired plating range.

Effect of Chromium Plating on Fatigue Strength

Various investigators have shown that chromium plating lowers the fatigue strength of steels. Fatigue strength is now recognized as one of the important properties of metals. Prof. M. J. Sinnott of the University of Michigan recently completed a thorough investigation to compare the fatigue strength of heat-treated SAE 4130 steel before and after chromium plating. In these tests, a series of 108 identical fatigue-test specimens was prepared and divided into 9 sets of 12 each. One set was fatigue tested without chromium plating. The remaining 8 sets were chromium plated in the Detroit laboratories of United Chromium, Inc. One set was plated with chromium to a thickness of 0.001 inch and another set to a thickness of 0.010 inch in each of four different chromium plating solutions. One was the ordinary chromium plating solution having a chromic acid concentration of 250 gm./l. The other three solutions were Unichrome Self-Regulating High-Speed ("S.R.H.S.") chromium plating solutions CR-100, CR-110, and CR-160.

Self-Regulating High-Speed Chromium Plating Bath

At the A.E.S. 37th Annual Convention, workers at United Chromium, Inc., described the self-regulating high-speed type of chromium plating bath, termed the "S.R.H.S." bath which was evaluated in the above fatigue tests. The bath was reported to be automatically self-regulating within narrow limits with respect to mixed and cooperating catalysts or acid radicals at any chosen chromic acid concentration

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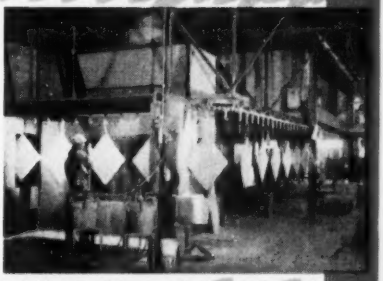

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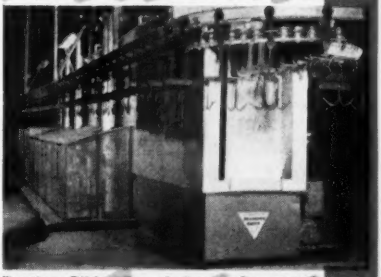

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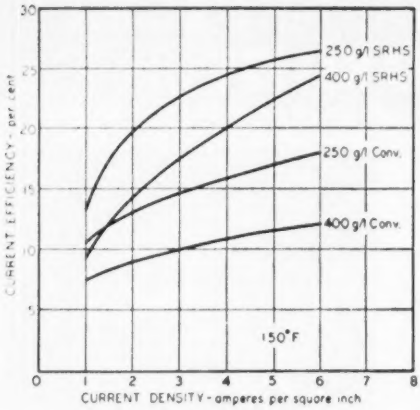


Fig. 3—Current efficiency vs. current density for S.R.H.S. and conventional chromium plating solutions (150 deg. F.).
(Illustration courtesy American Electroplaters' Society.)

and temperature. Baths have been operated in the field at wide ranges in concentrations to meet a variety of plating requirements—150 to 500 gm./l. (20 to 67 oz./gal.) at 27 to 66 deg. C. (80 to 150 deg. F.).

"S.R.H.S." baths give higher current efficiency and allow the use of higher current densities than conventional baths. Figure 3 shows current-efficiency curves for various chromium plating baths based on United Chromium laboratory data. Deposits are described as generally smoother with less tendency to form nodular growths, trees, and pimples than conventional baths. In one hard chromium plating installation, the plating time of 5½ hours for a certain thickness was reduced to 3½ hours with the "S.R.H.S." bath.

Activating effect is another important characteristic claimed for the "S.R.H.S." baths. It accounts for the ability of these baths to plate better over passive surfaces and to withstand current interruptions better, without pronounced dulling and streaking. The ability to do a better job in plating chromium on chromium has practical application in salvage of "misplates." Better coverage, another advantage cited for the self-regulating type bath has made possible increased production in some plants by permitting more pieces per rack.

Method Used for Fatigue Testing At University of Michigan

Prof. Sinnott's fatigue tests on unplated and chromium plated steel were made on the R. R. Moore Fatigue Testing Machine. The specimen being tested is mounted between the two cylindrical housings shown on the left in Fig. 4. These housings are supported on pivots so that the knife edges near the test specimens are free to move up

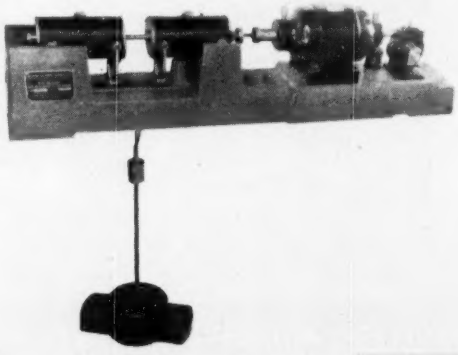
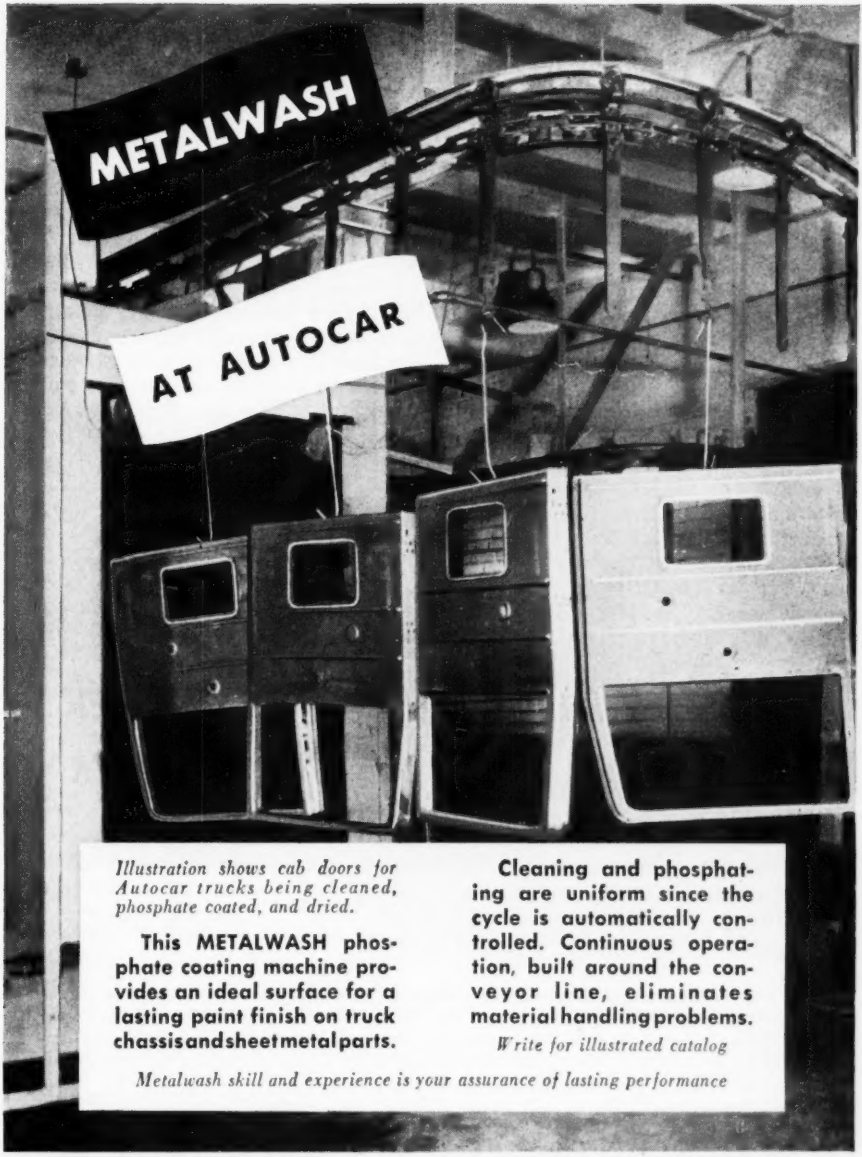


Fig. 4—R. R. Moore fatigue testing machine made by the Baldwin Locomotive Works. This machine was used by Prof. M. J. Sinnott, University of Michigan, in testing the fatigue strength of chromium plated steel.
(Photo courtesy United Chromium, Inc., New York 17, N. Y.)



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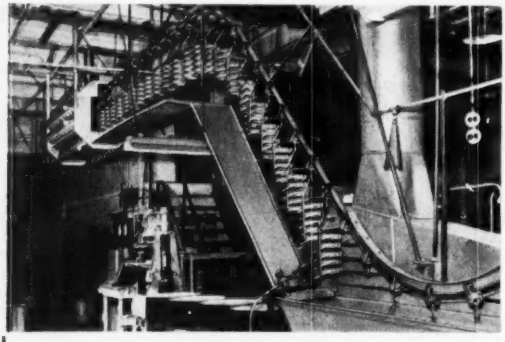
and down. The four knife edges support the weights, which may be increased a half pound at a time up to 100 pounds. Bearings within the housing permit the motor to rotate the test specimen at a speed ranging from 1,000 to 12,000 r.p.m. When the specimen is in one position, the upper half is under compression and the lower half under tension. When rotated one-half revolution, these stresses are reversed. The action has the same effect as bending a piece of wire back and forth until it breaks.

In this machine, when testing a specimen with a diameter of 0.250 inch, a 1-pound weight corresponds to a stress on the specimen of 1,300 lb./sq. in. The instrument shown on the right in Fig. 4 records the number of revolutions, which are referred to as "cycles of stress." The testing machine is run day and night; an automatic switch stops motor when specimen breaks.

Making the Test

The purpose of the fatigue test is to determine the fatigue limit of each specimen. The fatigue limit is the greatest stress the specimen will withstand without breaking during an infinitely large number of cycles. Experiments have shown that if a steel specimen withstands 10,000,000 cycles of stress, it will not break at that stress even if the number of cycles is increased many times. In the tests conducted at the University of Michigan, according to data made available by United Chromium, Inc., the stress was expressed in pounds per square inch and the fatigue limit was based on at least 10,000,000 cycles of stress. A specimen was mounted on the machine and a large enough load was applied to exceed the probable fatigue limit. In most cases the initial load was about 75 pounds, corresponding to a stress of about 100,000 lb./sq. in.



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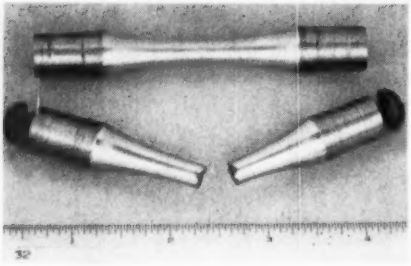

Fig. 5—Chromium plated fatigue test specimens used in the University of Michigan tests. *(Photo courtesy United Chromium, Inc., New York 17, N. Y.)*

The specimen broke after running about 25,000 cycles. The load was reduced on each succeeding specimen of the set until several specimens ran over 10,000,000 cycles of stress without breaking.

Figure 5 shows what the fatigue test specimens looked like and gives some idea of their size. The upper specimen withstood over 10,000,000 cycles without breaking. The lower specimen broke after comparatively few cycles of stress. The appearance of the fracture indicates the difference between the tensile test and the fatigue test. A somewhat similar specimen used for the tensile test usually stretches and necks down to a smaller diameter before it breaks. The lower specimen in Fig. 5 shows no deformation of the metal. Breaking of machine parts due to fatigue failure is treacherous because it occurs suddenly, without warning.

Results of Fatigue Tests

The fatigue strength of each set of specimens was taken as the stress in pounds per square inch which a number of the specimens withstood for at least 10,000,000 cycles of stress without breaking. Table II shows results obtained by Professor Sinnott on specimens plated with chromium 0.001 inch thick.

According to these results, the loss in fatigue strength of SAE 4130 steel due to chromium plating is about 70 per cent less with the Unichrome "S.R.H.S." bath (solution CR-110) than the ordinary solution.

Bureau of Standards Chrome Plating Endurance Tests

The National Bureau of Standards has studied the effect of chromium plating on the fatigue properties of steels used in aircraft. Tests were conducted by H. L. Logan in the "as plated" condition and after heating, using SAE X4130 and 6130 steels. These tests showed that the endurance limits of these steels was reduced by

Table II

FATIGUE PROPERTIES OF CHROMIUM-PLATED HEAT-TREATED SAE 4130 STEEL

CHROMIUM PLATING SOLUTION	FATIGUE STRENGTH psi	% LOSS OVER UNPLATED
Unplated	81,500	——
Ordinary	60,500	25.7
"S.R.H.S." CR-100 bath	75,200	7.7
"S.R.H.S." CR-110 bath	75,300	7.6
"S.R.H.S." CR-160 bath	69,000	15.4

(Based on data supplied by United Chromium, Inc.)

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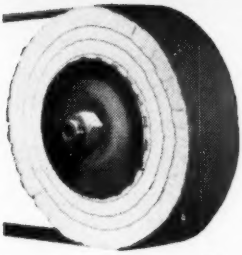

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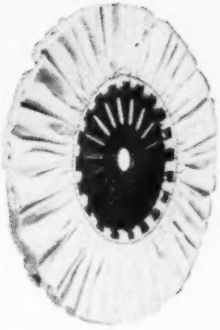

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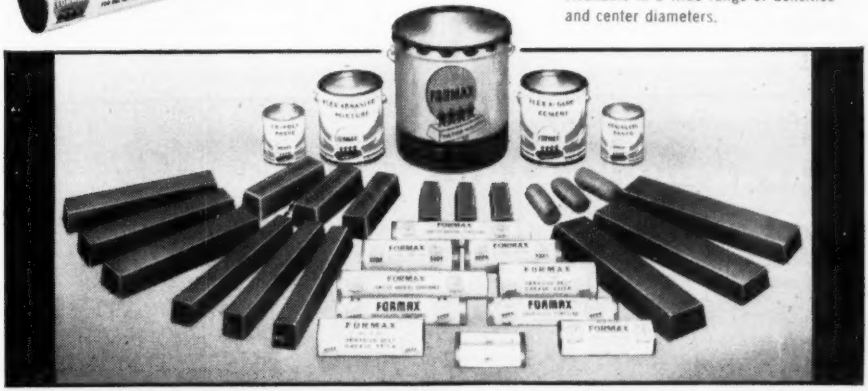

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chromium plating. The endurance limit was found to decrease with increasing hardness of the steel. The decrease in the endurance limit of the normalized steel caused by chromium plating was generally small; the minimum endurance limit of any group of plated specimens was 75 per cent of the endurance limit of the unplated steel. This value was obtained on specimens plated to a thickness of 0.001 inch at a current density of 1,000 amp./sq. ft. Most sets of specimens had endurance limits ranging from 83 to 95.5 per cent of that of the unplated steel. Specimens plated in the bath at 132 deg. F. and a current density of 200 amp./sq. ft. had endurance limits equal to or greater than those plated at 158 deg. F. and 1,000 amp./sq. ft. For steel of a given hardness (Rockwell 40-C), the reductions in endurance limit increased with increased plating bath temperature.

Logan also reported that the endurance limits of test specimens plated and subsequently surface ground, were equal to or greater than those of unground specimens having the same final plating thickness. Interruption of the plating process did not affect the endurance limit of the plated specimens, provided that proper precautions for plating chromium on chromium were taken before the plating was resumed.

The endurance limit of specimens heated after plating and tested at room temperature, according to the Bureau of Standards report, reached a maximum value for baking temperature between 374 and 572 deg. F. Also, endurance limits of specimens heated for 1 hour at 1,024 deg. F. were significantly higher than those of the "as plated" steel.

It has been postulated that reduction of the endurance limit of steel by chromium is due, in part at least, to residual tensile stresses in the chro-

PARAMOUNT BRAND

FELT WHEELS

...TOPS IN "Contourability"

Are you finishing articles which require a wheel with a "shaped" or contoured face? Don't forget that felt wheels lend themselves to contouring probably better than any other type of wheel. Don't forget, too, you have nine degrees of hardness to choose from when you buy Bacon Felt Wheels—The Paramount Brand. Ask your supply house for Paramount Brand Felt Polish Wheels.

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Established 1825

TAUNTON "America's Oldest Felt Manufacturer"

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Your Supply House can Furnish Bacon PARAMOUNT BRAND FELT BOBS & WHEELS

Eliminate "Heavy Overtime"

PEEL SPRAY-BOOTHS CLEAN WITH LIQUID ENVELOPE

Good men are hard to get today. Why waste their time and your money—on the "jack-ass labor" job of scraping down spray-booths? Keep your booths clean, firesafe, better illuminated, better ventilated by using "LIQUID ENVELOPE".

Simply spray on with your regular spray-equipment. When overspray accumulates, break film and peel off in great big sheets. Takes only a few minutes for a 12 x 12 booth. Actually costs less than the hand-labor way. Order a 5-gallon Test Sample (Drum Lot Price on test-sample order!)

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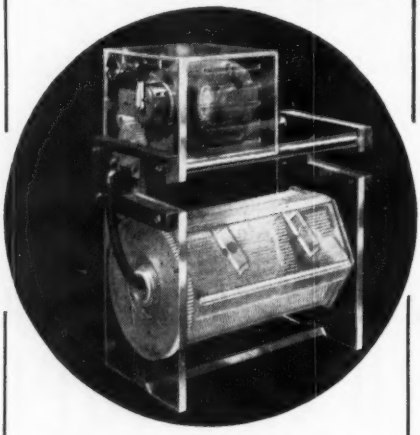
IT'S NEW! the 1953 Model



Portable Lucite Plating Barrel

THE STUTZ PORTABLE PLATING BARREL is designed and constructed of High Temperature Lucite to provide continuous processing of piece parts through the operation of Alkali Cleaning, Water Rinsing, Acid Treatment and Plating. Progression through these operations is made by manual handling or if necessary with the assist of an overhead traveling hoist. The STUTZ PORTABLE PLATING BARREL is made in two sizes with cylinders having inside dimensions of 6" x 12" and 8" x 18". Standard perforations are 3/32" or larger. Smaller openings can be furnished as required. All gears are ½" High Temperative Lucite. Gear bearings are permanently lubricated. New heavy duty motor. Operating temperature up to 185° F.

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mium. Heating of chromium increases its density and hence decreases its volume. At sufficiently high temperatures, the concurrent contraction of the chromium plate and expansion of the steel stresses the chromium above its ultimate tensile strength, thus relieving some of the residual stresses in the chromium and increasing the endurance limit of the plated test pieces. All these studies emphasize to the plater that the engineering requirements of hard chromium plated parts should be kept in mind.

Zeolite Water Softeners. Troubles caused by the utilization of hard water and the multiple economies effected by curing them are discussed in a 16-page bulletin (No. 2386) issued by The Permutit Company, 330 West 42nd Street, New York 36, N. Y.

The bulletin lists several industries in which steam and water are of importance. It explains the three basic types of ion-exchange equipment and shows how these units can be profitably utilized.

Vacuum Metallizing Today. A 20-page, well illustrated brochure on the uses of vacuum metallizing may now be obtained from the F. J. Stokes Machine Co., Taber Road, Philadelphia 20, Pa.

This catalog, No. 725, lists the basic advantages of vacuum metallizing, presents the various materials and properties of coatings so obtained, and explains the process with detailed drawings and illustrations. Specifications for the various Stokes units are also included.

Drying and Finishing Ovens. A 22-page reprint on drying and finishing ovens by James D. Russell, is being made available by the Young Brothers Company, 1931 Columbus Road, Cleveland 13, Ohio.

Well illustrated with application photographs, the brochure discusses in detail batch type ovens, car type ovens, continuous conveyor type ovens and various other designs. Engineering data on heat curves and effective air circulation is presented.

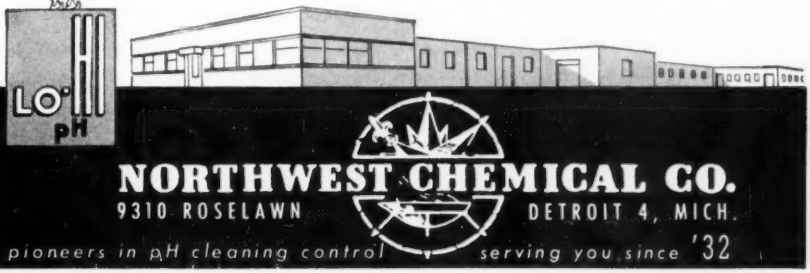
Which One?

They look alike—they are identical—yet one of these parts will wind up as a reject while the other will be the pride of the finishing room.

They both look clean and ready for finish—the difference is that one is "chemically" cleaned with job-adjusted Northwest products while the other got by with a fast dip and rinse.

The finish can be no better than the cleaning job beneath it. Why take a chance with haphazard methods and ordinary chemicals when it costs no more to be sure they're clean with a Northwest job-adjusted treatment?

Got a problem? Let our cleaning experts help you!



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Finishes

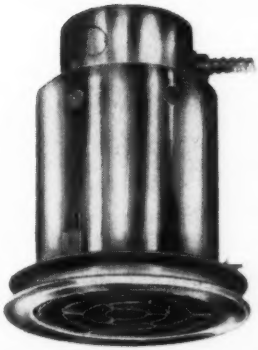
This Stromberg - Carlson 1243 telephone has a die cast aluminum base which is treated with Bonderite before painting.

(Photo courtesy Parker Rust Proof Co., Detroit 11, Mich.)

The Precision Torque Balance here illustrated is imported from Holland and distributed by Ohaus Scale Corporation. The stand and part of the case are finished in black wrinkle enamel and the remainder of the balance is finished in highly polished nickel plate.

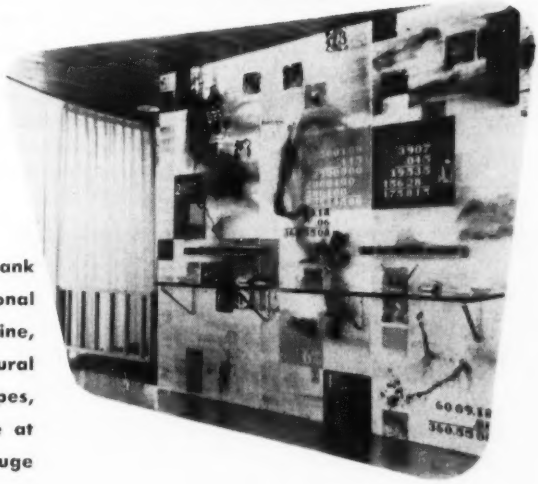
(Photo courtesy Ohaus Scale Corp., Union, N. J.)

that aid in appearance and utility



Swivelier's Recessed Ceiling Top-Lite here illustrated is finished in aluminum lacquer baked on with infra-red heat.

(Photo courtesy Swivilier Company, Inc., New York 3, N. Y.)



The outer wall of the bank vault of the York National Bank at Old Orchard, Maine, is a porcelainized mural painted by Gyorgy Kepes, Professor of Architecture at M.I.T., and fired on 16 gauge enameling iron at a temperature of 1600 deg. F. by the Bettinger Corporation, Waltham, Massachusetts. Following the porcelain enameling operation, the panels were laminated to plywood to achieve a perfectly flat surface.

(Photo courtesy the Bettinger Corp., Waltham, Mass.)

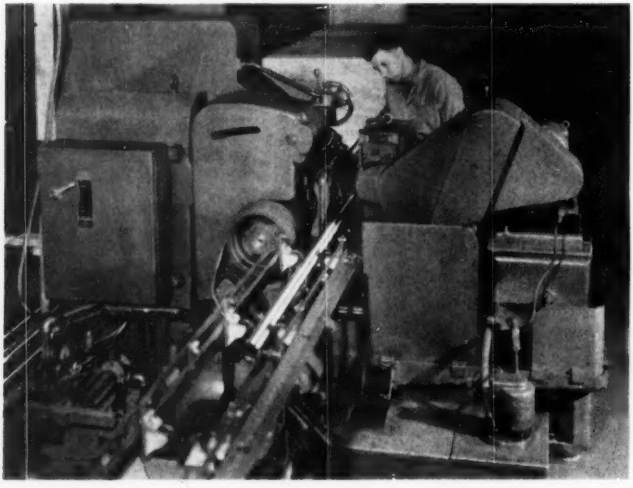
Practical Applications of modern products

Abrasive Belts in Centerless Grinder Speed Extruded Tube Production

TWO coated abrasive belts are the elements of a centerless grinder that removes pounds of stock from a 15-foot length of 2.375-inch o.d. tubing in 2 minutes. The result of cooperative engineering between Behr-Manning Corporation of Troy, N. Y., and Production Machine Co., of Greenfield, Mass., the process makes possible a grinding rate for cylindrical stock faster than any other method of precision grinding.

For Grinding Extruded Tubing

Although this method of grinding is adaptable for fast finishing of cylindrical stock of most materials, it was developed primarily for grinding stainless steel and other high alloy tubes produced by the Ugine-Sejournet extrusion process, in which the hot steel billet is forced through a Fiberglas lubricated die. Extruded tubing thus produced must be ground to remove the rough surface that results from the high extrusion pressures, and to remove taper from the cylindrical stock (up to 0.020 inch per 15-foot length). Stock removal and not surface condition was the major consideration in finishing the extruded tubing, but 20 to 30 micro-inch finishes are obtainable using fine grit belts. Tolerances of plus or minus 0.001 inch taper, end to end, are held.



Uses Two Abrasive Belts

Two coated abrasive belts are used on the machine. A 50 grit aluminum oxide waterproof cloth abrasive belt 9 inches wide and 168 inches long

Fig. 1 — Cylindrical stock finished with this centerless grinder is controlled and ground by two coated abrasive belts.

does the grinding. The work is fed past the grinding belt by a 220 grit aluminum oxide waterproof cloth abrasive regulator belt 9¾ inches wide and 58 inches long.

A cutting oil lubricates the grinding belt. Sprayed on the belt by a fan type nozzle, the recirculating lubricant flushes away the grinding swarf and prevents rewelding of the chips.

A steel contact wheel mounted on a 4 inch shaft supports the grinding belt against the work. The use of steel contact wheels is a new concept in grinding with coated abrasive belts. In addition to backing up the belt, the steel wheel serves as the belt drive pulley. Driven by V-belts from a 25 h.p. electric motor, the 20 inch diameter wheel forces the belt past the work at speeds of 3,500-10,000 s.f.m. It is rigidly mounted in ball bearings to prevent deflection under the very high grinding pressures imposed on it. The steel contact wheel weighs approximately 350 pounds.

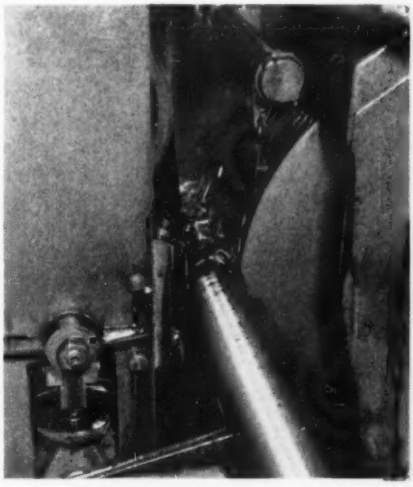
Adjustable Regulator Belt

The regulator belt assembly consists of the coated abrasive belt, a variable speed drive, an idler pulley, and a flat steel back-up platen which holds the regulator against the work. This entire assembly can be adjusted about a horizontal axis to provide a work feed angle of from 0 to 15 deg. in either direction from the vertical. This angular adjustment, together with the variable speed drive, makes possible an infinitely variable work piece feed rate from 0 to 30 ft./min.

Use of a coated abrasive regulator belt, operating over a rigid platen, offers a decided advantage over rubber bonded regulator wheels, as used in the conventional centerless grinders. Work feed angle of the coated abrasive regulator belt can be changed at will. A rubber bonded regulator wheel, on the other hand, must be reshaped whenever the work feed angle is changed.

The regulator belt, powered by a variable speed drive, controls the rotation of the work against the grinding belt. Control of pressure between work

Fig. 2—Oil flows from the fan type nozzle above the work, onto the abrasive grinding belt. The grinding belt passes over the steel contact wheel at right and the regulator belt passes over the flat platen at left. Distance between the belts can be adjusted for tube sizes from one to six inches in diameter.



piece and regulator belt is maintained by placing the work rest closer to the grinding belt than to the regulator belt.

The regulator belt is ¾ inch wider than the grinding belt. The extra width of the regulator belt is extended on the in-feed side of the machine in order to start the work piece rotating before it reaches the grinding belt.

By setting a small taper between the contact wheel spindle and the face of the back-up platen, a uniform rate of stock removal is maintained across the entire belt width. As a result of the uniform pressure across the face of the belt, dimensional accuracy is assured throughout belt life.

Grinding Results

The main objectives of this method of grinding are: to remove stock from the extruded tubing at a faster rate not obtainable by any other method of grinding; to remove the Fiberglas skin and extrusion die marks; to remove the taper from the tubing; and to provide an acceptable finish on the tubing. Tests have demonstrated that the coated abrasive belt grinding process with cutting oil as a lubricant will accomplish these objectives.

Data compiled by the Behr-Manning Products Engineering Department indicates that the coated abrasive belt grinding process is economically practical. Results of a series of test runs made using one belt on 12 bars of Timkin 52,100 alloy steel show that the belt removed as much stock during the last pass of the twelfth bar as was removed during the first pass of the first bar. Throughout this series of tests, the work feed angle and the work feed rate remained constant.

Because of the rigid construction of the machine, and its high ratio of horsepower to belt width (nearly 3 h.p. per inch of belt width) extremely high grinding pressures can be developed. Full advantage is taken of

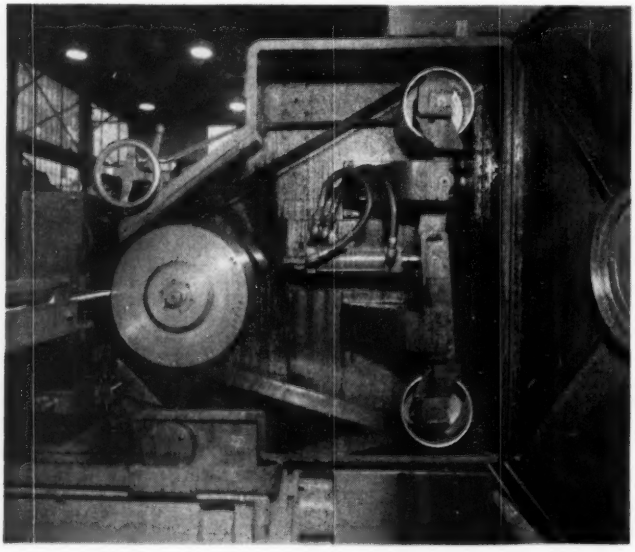


Fig. 3—Coated abrasive grinding belt passes over a steel contact wheel (at left) and two idler wheels. The lever-mounted idler wheels maintain belt tension. Power to drive the belt is transmitted from a 25 h.p. motor by a multiple V-belt drive to the contact wheel.

the inherent ability of coated abrasive belts to remove tremendous quantities of stock without overheating the work and causing burning, distortion and loss of dimensional accuracy.

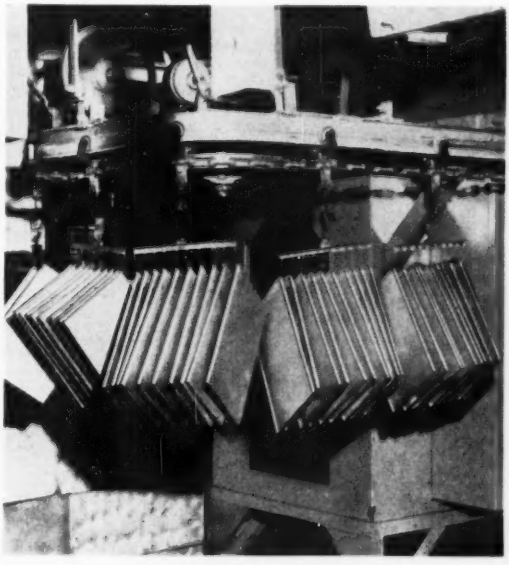
New Conveyor Line

THOUGH recently announced, ISC conveyors have been for many years in wide use in applications requiring lightweight carriers combined with heavy-duty service and low initial and operating costs. Typical is the installation, herewith illustrated, in the Andrew B. Hendryx Co., New Haven, Connecticut. The conveyor has a powerful, shear-pin protected corner sprocket-drive and carries the ware through the complete finishing cycle.

The sheet metal is stamped, drilled, punched and formed, and then loaded on the ISC overhead monorail conveyor. The conveyor is integrated into an Industrial Washing Machine, made by Industrial Systems Company, Dept. ISCO, New Brunswick, New Jersey.

In the washer, the metal is cleaned and phosphatized using Parcolite 40, a product of the Parker Rust Proof Company. The cleaning process is divided into three stages: clean and phosphatize for one minute; spray rinse with cold water for 30 seconds; and spray rinse with chromic acid for 30 seconds.

Parts are next conveyed through a dryer held at 215 deg. F. and then through the paint department. Ware is finished with Keystone synthetic enamel applied in a semi-automatic dip installation or by the use of Sprayco spray guns. Operated under 60 p.s.i. air pressure, the guns are used in a Peters-Dalton Hydro-Whirl water curtain spray booth.



Lightweight conveyor carrying ware into the washing machine.

Two World War II movies, 16-mm with sound, showing actual front line action from start to finish of the war, are available from Harvie Johnson, Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill. The movies run about 45 minutes each and will be furnished without charge to associations, clubs, employee organizations, and other groups.

NEWS of the Industry

NEW PLANTS

Purchase of the Rome Machinery Sales and Engineering Company, manufacturer of buffing and polishing lathes, has been announced by John T. Schenck, president of **THE ENGELBERG HULLER COMPANY, INC.**, Syracuse, New York.

The new acquisition will be operated as the Rome Machinery Division of Engelberg Huller. Manufacturing operations will be moved to the Engelberg plant in Syracuse, Mr. Schenck stated.

In making the announcement, Mr. Schenck noted that The Engelberg Huller Company, Inc., in addition to manufacturing its regular line of processing equipment, has been a builder of special machinery for more than sixty years. Inasmuch as the Rome Machine line includes buffing and polishing lathes and special automatic machinery of all kinds in the finishing line, the move is a natural one.

Norman Chester, former owner and general manager of the Rome Company, has affiliated with Engelberg Huller.

THE PARK CHEMICAL COMPANY, Detroit manufacturer of heat treating materials and automotive chemicals, has acquired new manufacturing and warehousing facilities at 3031 Melvale St. Philadelphia, Pennsylvania.

T. J. Clark, general manager of Park's Eastern Division, will have complete charge of its operation with C. H. Eisler as plant manager.

The need for expanded manufacturing facilities and substantially increased plant area has necessitated the relocation of **INDUSTRIAL WASHING MACHINE CORP.**, to Matawan, New Jersey, it has been announced by Howard M. Sadwith, President of the Company. The move from New Brunswick to the present site at 32 Main Street, Matawan, has provided four times the floor space of the former plant. The new quarters, it has been stated, will make possible an increased production schedule.

As exclusive agents for the manufacturer, Industrial Systems Company will

continue to handle all sales matters through its New Brunswick, New Jersey, office.

Purchase of the Eagle-Picher paint plant in Atlanta, Ga., by the **GLIDDEN COMPANY**, and plans for doubling its capacity have been announced by Adrian D. Joyce, Glidden board chairman.

Announcement of Glidden's purchase of the plant was made following the disclosure that Eagle-Picher will cease manufacture of paints and varnishes.

In addition to the Atlanta plant, equipment and raw material inventory, Mr. Joyce revealed that Glidden has purchased an additional five-acre tract of adjoining land for construction of a new office building and finished stock warehouse.

The Atlanta plant, which was built for paint manufacture, incorporates the latest principles of materials handling. Laid out on three levels, the plant receives raw materials at the highest level. Gravity is employed for the movement of material to the manufacturing equipment on the intermediate level and finished products move to the lower level for storage and shipment.

Purchase of a 125-acre tract on St. Paul's eastern boundary for a long-range building program for research purposes has been announced by **MINNESOTA MINING & MANUFACTURING CO.**, St. Paul, Minnesota.

Plans call for housing many of the firm's major research projects on the tract located at Highway 12 and East Ave.

The first unit in the multi-million dollar development will be a $3,000,000 laboratory for the company's central research department. Construction of this unit will start this spring. It will be completed in the fall of 1954, William L. McKnight, 3M board chairman said.

Announcement of the plans for the research area development came as 3M entered its second half century in business. The company was organized as an abrasive mineral mining firm on the shores of Lake Superior in Two Harbors, Minnesota in 1902. It now has plants located throughout the United States, and Canada, England, France, Germany, Mexico and Brazil.

The company's principal products include cellophane, masking, industrial, filament, electrical, and sound recording tapes, abrasives, adhesives, roofing granules, reflective materials, office duplicating equipment, and chemicals.

COMPANIES

THE PENNSYLVANIA SALT MANUFACTURING COMPANY has announced

Field service representatives from the Canadian, Chicago, New England, New York and Philadelphia sales divisions of OAKITE PRODUCTS, INC., manufacturer of specialized cleaning and allied materials, are shown as they gathered for a series of technical-sales meetings at the Roosevelt Hotel in New York City, December 8-10. Featured at these meetings were reports from Oakite research chemists, service engineers and technicians on recent developments in cleaning and related procedures designed to assist industry in combating rising operating costs. Similar conferences held in Hollywood, California, and St. Louis during November were attended by representatives from the Company's North Pacific Coast, South Pacific Coast, Southwestern and Milwaukee divisions, and from its Cleveland, Detroit, Midwestern, St. Louis and Southern sales territories respectively.

Quality starts with a Superior finish

The finish on your product reflects the craftsmanship, the quality of that item. That's why so many metal fabricators specify Haskins Flexible Shaft Machines for all their polishing, sanding, grinding, buffing, and filing operations. Like this manufacturer of stainless steel sinks, they have found that Haskins power and the right attachment provide precision operation that assures quality production.

Because you handle only a light handpiece—not a heavy motor—you find that operator fatigue is reduced, production goes up. And multi-speed power allows selection of the right speed for varied operations.

You'll find the right combination of power, speed and attachments for your specific application in the complete Haskins line. Write today and ask for our recommendation on your grinding, sanding, filing or polishing job — no obligation, of course. R. G. Haskins Co., 2643 W. Harrison St., Chicago 12, Ill.

Your choice of Bench Mounted, Suspended, or Pedestal Mounted.

haskins

FLEXIBLE SHAFT EQUIPMENT

that Henry S. Rondeau and the Cleveland Industries Company, 1935 Euclid Avenue, Cleveland, have been appointed representatives in Ohio and Northern Kentucky.

In a review of the **HERCULES POWDER COMPANY'S** activities for the past year, company officials noted a steady expansion of applications for established basic products in such varied fields as drugs and cosmetics, laundry, paints, varnishes, lacquers, paper, and synthetic rubber. Besides, there was an important growth of new products and markets.

Hercules' products contributed to several new developments in the coatings field during the past year. Manufacturers announced that they were making available quick-drying, tough, and colorful lacquers in easy-to-use aerosol spray containers. Hercules nitrocellulose is the base for these lacquers. These handy containers are now being made available for use in homes for spraying or touching up furniture, refrigerators, stoves, and cars.

A new, dry, tall-oil Dresinate, Dresinate TX, is used in alkaline metal-cleaning compounds.

Use of Dresinols as modifiers and extenders of synthetic latexes and polyvinyl acetate has grown rapidly in 1952.

New Parlon (chlorinated rubber) formulations were developed during the year for use, especially for glossy, hard varnishes; wall paints; and floor paints. The new formulations are dispersions rather than true solutions. These dissolve during the drying period to give clear, quick drying, glossy, and homogenous films. Paints made from these dispersions have no brush drag and can be sprayed at high solids. They use less aromatic solvent, and so have less odor. High mineral spirits solvents content, and no need for special thinners, mean lower costs.

During 1952, the Synthetics Department developed at its Mansfield, Massachusetts, plant a grade of pentaerythritol of uniform high quality, and dependable from batch to batch. Recognizing that the major use for pentaerythritol today is in the manufacture of alkyd resins, the department studied the needs of this use with great care, and established those properties which would be of maximum advantage to the resin manufacturer.

Production capacity for manufacture of "Hercoflex" vinyl plasticizers was stepped up 40 per cent at the department's Mansfield plant in January. These plasticizers have low-temperature flexibility and low volatility properties which make

them useful to manufacture of film, sheeting, coated fabrics, and molded and extruded plastics.

Highlighting overseas activities for 1952, a subsidiary company, Hercules Powder Company, Ltd., completed construction of a new rosin-size plant at Erith, Kent, England. The plant supplies chemicals for British paper manufacturers.

Export sales remained an important part of the company's activities. Hercules has overseas subsidiaries with offices in England and Holland, and is associated with a network of distributors in 51 foreign countries, covering all continents and major island groupings in the world.

COLONIAL ALLOYS COMPANY of Philadelphia has announced the appointment of Philton Company of Wilmington, Del., to represent Colonial throughout the world in the sale of its products and the granting of licenses to use the company's processes. Colonial Alloys has originated and owns various patents and techniques having to do with anodizing, chemical polishing, cleaning and dyeing of aluminum and its alloys.

Headquarters for the western division of **HEWITT-ROBINS INCORPORATED** at Los Angeles and another for the south central division at Houston have been opened, it was announced by Thomas Robins, Jr., president.

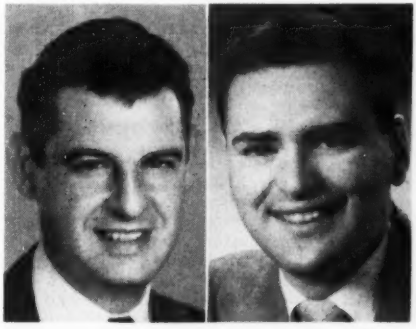
The streamlined one-story buildings will contain offices for sales and engineering personnel and warehouse space for belting, hose and conveyor equipment. The Los Angeles building, at 2533 Malt Avenue, will have 13,000 square feet of floor space; the one at Houston, 5711 Navigation Boulevard, will have 10,600 feet.

NEW POSITIONS

The L. H. Butcher Company, Los Angeles, subsidiary of the Udylite Corporation, has appointed **JACK RASKIN** West Coast manager for the Metal Finishing Division. **EARL ARNOLD** has been appointed Mr. Raskin's assistant and **BILL LIDTKE**, formerly of the Udylite Corporation of Detroit, is outside service representative in the Los Angeles area.

Appointment of **BERT J. SHERWOOD** to the position of technical representative, specializing in Enthone products, has also been announced by the L. H. Butcher Company. Although his headquarters will be at the Los Angeles office, Mr. Sherwood will be available to the finishing industry in the eleven Western states served by the other L. H. Butcher offices.

In his previous position as leading engineer in charge of the Metal Finishing



Jack Raskin (left), Bert J. Sherwood

Unit of the Materials Research Process Development Group at North American Aviation in Downey, California, Mr. Sherwood supervised a group of chemical technicians and engineers engaged in research, development, pilot plant evaluation, and consultations on the metal finishing problems relating to guided missle and electromechanical component fabrication.

C. Whitfield Smith, president of the Whitfield Chemical Co., Detroit manufacturer of metal cleaning and finishing chemicals, has announced the appointment of **NATHAN H. BRYANT** as western Michigan representative. Mr. Bryant was formerly associated with Attwood Brass Co., Grand Rapids, Michigan. He will make his headquarters in that city.

ALFRED C. WOMER has been appointed field engineer in Norton Company's Cleveland area, it has been announced by Ralph M. Johnson, vice president in charge of sales.

Mr. Womer joined the Company's assembly department, Grinding Machine Division in 1935. From 1939 to 1946, he was

a serviceman and demonstrator for the Division in United States and Canada, with six months of this time spent in Brazil. In early 1946, he was appointed resident demonstrator in the Cleveland area holding this position until last September when he joined the sales training department for a short course in Abrasive Division activities.

Three top administrative promotions at Pittsburgh Plate Glass Company's research laboratories, Creighton, Pa., have been announced by Richard E. Tucker, executive vice president.

E. LESTER FIX, associated with the glass division s research operations since 1928, has been appointed associate derector of research. He will be responsible for the general administrative direction of laboratory operations. In this position, he will be associated with Dr. S. Frank Cox, director of research.

BROOKS J. DENNISON has been appointed assistant director of research. He will be principally concerned with general laboratory activities in which field he will work closely with the associate director.

Also appointed assistant director of research is **DR. JAMES E. ARCHER** who will assume direction of the expanded program of fundamental research.

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SCO Importers

Stuart C. Olsen Company

WEST ROAD NORFOLK 1, CONN.

Columbia Electric Mfg. Co., Cleveland, Ohio, has announced the appointment of **HOMER W. SUSSMAN** as general sales manager.

Homer W. Sussman

Mr. Sussman joined the firm as a student engineer in 1935, immediately after receiving his B.S. degree in electrical engineering from Case Institute of Technology. In his new position he will assume responsibility for an expanded sales program covering the company's line of alternating and direct current generators, low voltage generators and motor generator sets, synchronous motors, tank rheostats and electrical instruments.

He is a member of the American Institute of Electrical Engineers, and Association of Iron and Steel Engineers.

It has been announced that **ALFRED E. PRATT,** Philadelphia regional transportation sales manager of the Du Pont Company's Finishes Division since 1933, has retired after more than 26 years with the company.

Mr. Pratt was in charge of sales of paints and other finishes to the railway, aviation, marine, petroleum and steel industries in the area. Since his retirement, sales in these fields are being handled by **ROBERT M. DEAN, JR.,** regional industrial sales manager since 1947, assisted by **JOHN D. STOKES,** district industrial sales manager.

HAROLD LARSEN has been appointed assistant to the manager of the Nickel Sales Department of The International Nickel Company, Inc., according to an announcement by Walter C. Kerrigan, vice president and general sales manager.

For the past twenty-six years Mr. Larsen has been with Inco's Nickel Sales Department where he has been assistant section head in the Distributor's Sales Section. Recently he has been on the staff of the National Production Authority at Washington as chief of the Nickel Section of the Iron and Steel Division. He is a member of the American Foundrymen's Society and the American Society for Metals.

NEWELL P. BECKWITH has been appointed vice-president and technical director of the Rinshed-Mason Company, Detroit, it was announced by company president, Frederick G. Weed. The company manufactures automotive, industrial and architectural finishes.

Newell P. Beckwith

Previous to this appointment, Beckwith was director of research at R-M. He is a graduate chemist and is currently National treasurer of the Federation of Paint and Varnish Production Clubs and chairman of the Joint Technical Educational Committee of National Paint Organizations.

He is on the D-1 Committee of the American Society for Testing Materials and a member of the Society of Automotive Engineers. Except for a four year term as an Army Ground Forces Staff Officer (1941-1945), he has been with Rinshed-Mason since 1940.

All statistical and analytical functions pertaining to marketing in the Pennsylvania Salt Manufacturing Co. have been combined into a newly organized Sales Research Department, with **E. M. OTT** as manager, it was announced by William P. Drake, vice president.

Mr. Ott, the new department manager, a graduate of Drexel Institute of Technology, joined Pennsalt in November, 1940, and has been engaged in market research and chemical engineering.

Appointment of **LOUIS F. LONG, JR.**, as technical service director of The Glidden Company's central industrial region has been announced by G. S. Forbes, regional manager.

Louis F. Long, Jr.

Mr. Long joined The Glidden Company in 1947 as assistant manager of aviation sales. He subsequently became manager of aviation sales, then assistant to the technical service director, before being appointed to his present position.

A native of Macon, Georgia, Mr. Long is a graduate of Fredonia, N. Y., High School and Case Institute of Technology.

EDWARD G. PETHERICK, Los Altos, Calif., has retired after 25 years with Norton Co., Worcester, Mass., as an abrasive engineer covering northern California, southern Oregon, and western Nevada.

Edward G. Petherick

Mr. Petherick had worked for Norton Company since September 1, 1927. Previously he had worked for Simonds Saw & Steel Company where he started his business career in 1906. Simonds at that time was a distributor of Norton wheels.

NORMAN R. EKHOLM of Bellevue, Wash., will replace Mr. Petherick. **ARTHUR W. COX** will take over Mr. Ekholm's territory.

Murray R. Garfinkel, president, has announced that **ALEXANDER A. ROSS** has joined the Comet Chemical Co., Newark 5, N. J., manufacturer of plastic resin, lacquer coatings, and lacquer finishes.

Mr. Ross, previously a production executive with an industrial finish manufacturer, will devote his efforts to the improvement of Comet Chemical Company products. His background of technical know-how and production experience will aid him in the solution of the finishing problems of his customers.

The Permutit Company, New York, N. Y., manufacturer of ion exchange resins and water conditioning apparatus, announces the addition of **FELIX W. SACO** to its mechanical engineering department.

Mr. Saco, appointed to the position of mechanical development engineer, has been assigned to work on the design of all applications of ion exchange materials and techniques. He attended New York University, receiving a Bachelor's degree in Mechanical Engineering in 1940.

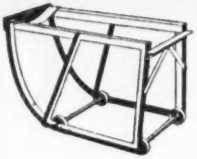
RODERICK L. SMITH has been appointed field engineer in the Chicago territory for Norton Co., Worcester, Mass., according to an announcement received from Ralph M. Johnson, vice president in charge of sales.

Roderick L. Smith (left), Philip H. Threshie

A similar appointment announced by Mr. Johnson is that of **PHILIP H. THRESHIE, JR.**, as field engineer in the Pacific Coast district.

DR. ROBERT W. CAIRNS, assistant director of research for Hercules Powder Company, has been named vice-chairman

America's Largest Line of DRUM AND BARREL HANDLING EQUIPMENT FOR QUALITY, PRICE & SERVICE



No. 40 $15.90

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No. 44 $36.20

No. 10 $20.70

Model No. 200 Drum Rotator

MORSE MANUFACTURING CO., INC. 762 West Manlius St. East Syracuse, N. Y.

of the Research and Development Board, a staff agency of the Secretary of Defense.

Dr. Cairns will be on loan to the government for one year, serving without compensation.

Dr. Cairns has been assistant director of the Hercules Research Department since 1945. Through his part in the administration of the entire Hercules' research program, he is experienced in the development of new chemical products and processes.

Arthur F. Gerada

Appointment of **ARTHUR F. GERADA** as sales engineer on the Udylite Corporation Cleveland district sales staff has been announced by A. J. Lupien, Cleveland District sales manager.

Working out of the Cleveland office, he will call upon Udylite customers in the Cincinnati area.

Gerada has been with Udylite for two years as a service engineer and control chemist in the Detroit customer service and pilot laboratories. Prior to joining Udylite, Gerada was graduated from Michigan State Normal College with a B.S. degree in chemistry.

American Cyanamid Company's Industrial Chemicals Division has announced two new appointments in its Metal Chemicals Section. **MR. PAUL J. KONDLA** was named Eastern Regional Representative, replacing **MR. A. E. BROADY** who will serve as a representative in the Cleveland District.

Frederick G. Weed, president of the Rinshed-Mason Company, Detroit, Mich., has announced the appointment of **RONALD J. REAGH** as Sales Representative. He will contact manufacturers in northeastern Michigan. Previous to this appointment, Mr. Reagh was Director of Industrial Relations at R-M and will be

Cyril J. Riedy (left), Ronald J. Reagh

succeeded in this post by **CYRIL J. RIEDY**, who had recently been Assistant Director of the Department of Coordination and Placement at the University of Detroit.

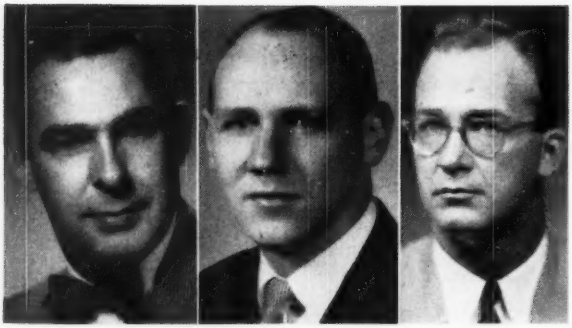
Philip Frederick

PHILIP FREDERICK has been appointed vice president in charge of sales promotion of The Monroe Sander Corporation of Long Island City, manufacturers of industrial finishes, paints, varnishes and lacquers, it was announced by Harold R. Tanney, vice president and general manager.

Mr. Frederick was formerly associated with the Standard-Toch Chemical Company and has had wide experience as a consultant to a large number of corporations in the installation of finishing equipment.

DON PATTERSON has been appointed sales representative for Michigan, for Michigan Chrome & Chemical Company, Chemical Division.

He will be responsible for sales of plating rack coatings, stop-off materials and corrosion resistant coatings for the



(Left to right) Don Patterson, Bob Richards, James Gonyeau.

electroplating industry, as well as vinyl plastisol applications pioneered by Michigan Chrome & Chemical Company.

BOB RICHARDS has been appointed Eastern territory sales representative.

Mr. Richards spent a number of years in the Army Air Corps, and attended Montana State College and Michigan State Normal. He was with Pittsburgh Plate Glass Company as sales representative prior to coming with Michigan Chrome & Chemical Company, where he received experience in the sale of Michigan Chrome's rack coatings in Michigan.

JAMES GONYEAU has been appointed Chicago area sales representative.

Mr. Gonyeau received his B. S. degree in Physics from Wayne University, Detroit, after completing several years' service in the Army during World War II. He represented Michigan Chrome & Chemical Company in Michigan for two years prior to assuming duties in the Chicago territory.

CHARLES E. GLENNON has been appointed sales engineer for the Platecoil Division of the Kold-Hold Manufacturing Company according to an announcement by C. P. Yoder, division sales manager. Mr. Glennon is a veteran of six years' experience as chief of the Industrial Division and production engineer for the Chicago Chemical Procurement District of the U. S. Army. He was responsible for procurement activities in all lines of manufacturing and chemical processing in sixteen states of the highly industrial Middle West.

HARRY C. MARTIN, director of research and development of The Carborundum Company, has been elected a vice president of the company, according to a recent announcement by Clinton F. Robinson, president.

Mr. Martin is a graduate of the University of Toronto and joined Carborundum's research laboratory in 1913. He developed a method for making cold molded resin bonded abrasive wheels, and took part in the development of fiber-backed abrasive discs, waterproof paper and electrocoated abrasive paper.

It was also announced that **FRED W. SCOTT, JR.,** has been appointed manager of the newly established merchandising sales division of the Company, according to F. J. Tone, Jr., vice president of Sales.

Mr. Scott formerly managed Sales for the coated products division and will now direct all functions of the merchandising sales division.

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Mr. Scott is a graduate from the College of Engineering, Cornell University and has been with the Carborundum Company since 1938.

Hal R. Sheaffer

HAL R. SHEAFFER has joined the staff of Metals Disintegrating Co., Inc., Elizabeth, N. J., as manager of pigment development. He will devote his time to development and sales work in connection with metal pigments, particularly gold bronze powders, in which he has an especially rich background and experience.

Mr. Schaeffer was previously executive vice president of Ohio Bronze Powder Co., Cleveland, Ohio, for a number of years, prior to which he was executive vice president of the Malone Bronze Powder Works, Inc., Malone, N. Y., for ten years.

John C. Malajan

JOHN C. MALAJAN has joined the Detroit sales office of the Udylite Corporation as sales engineer for the Michigan area. He has recently completed a comprehensive technical training course at the Detroit office. He was graduated from Albion College with a B.S. degree in chemistry. Following graduation he spent 18 months as a chemist with the U. S. Army, serving in the Pacific Theater.

Prior to joining Udylite, Malajan was associated with the Timken-Detroit Axle Company and Standard Oil Company of Indiana.

Appointment of **JOHN E. GIERE** to the Udylite Cleveland regional sales staff, has been announced by L. V. Nagle, Udylite Corporation vice president in charge of sales.

A former resident of Fort Wayne, Indiana, Mr. Giere is a graduate of the University of Detroit.

He served with the U. S. Navy in the Pacific theater during World War II.

John E. Giere

Announcement is made by the Williamsville Buff Division of The Bullard Clark Company of Danielson, Conn., and Charlotte, North Carolina of the appointment of **ED MARDORF** as sales engineer.

Mr. Mardorf, formerly president of the Elson Abrasives Corporation, will devote his time primarily to the sale of buffing and polishing wheels in Ohio.

Ed Mardorf

MR. RICHARD SCHERMER has been named manager of pump sales for The Duriron Company, Inc., Dayton, Ohio. Mr. Schermer joined Duriron in January, 1952, as building equipment sales manager after having served since 1945 as eastern district manager for Hills-McCanna Company.

MR. R. A. PROSSER has been appointed manager of building equipment sales. Mr. Prosser has been Chicago district manager for The Duriron Company since 1945.

MR. WENDELL A. WATKINS has been promoted to Chicago district manager. His successor as manager of the Buffalo sales territory, is **MR. D. E. CHRISTIE.**

DR. J. H. BRUUN has joined Hooker Electrochemical Company, Niagara Falls, N. Y., as director of research according to a joint announcement made by R. L. Murray, president of the company and J. H. Babcock, vice president in charge of development and research.

The appointment of **DR. GLENN H. McINTYRE** and **ORVILLE O. KENWORTHY** to key posts with the Ferro Corporation was announced by George W. Wallace, vice-president in charge of operations.

Dr. McIntyre was named technical director of the corporation and Mr. Kenworthy was appointed director of research. In his new position, Dr. McIntyre, who will also continue in his present post as vice-president, will supervise the technical work of all branches, divisions and subsidiaries.

Two other staff changes, also announced by Ferro are the appointment of **E. E. BRYANT** as technical director of the porcelain enamel division, and the appointment of **GRANT E. MILLER**, formerly of Ferro's sales department, to the post of director of enamel development.

The Century Vitreous Enamel Company of Chicago, manufacturers of porcelain enamel frit, has announced the appointment of **ROGER L. FELLOWS** as manager of their Frit Division.

Mr. Fellows is a graduate of the University of Illinois in Ceramic Engineering, a member of Sigma Xi, and a Fellow of the American Ceramic Society. He is past chairman of the Enamel Division.

MEETINGS

The **NEW YORK BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will hold its **ANNUAL TECHNICAL SESSION, BANQUET AND DANCE** on February 14, 1953, in the Statler Hotel, New York City.

The Technical Session, beginning at 3:00 p.m., is as follows:

"Economic Advantages of Preplated Wire,"—Peter Stevens, chemist, Kenmore Metal Prod. Corp.; "Quality Plating,"—C. F. Nixon, past president, A.E.S., General Motors Research Corp.; "What of Tomorrow,"—Dr. Louis Weisberg, consultant.

Tickets for the banquet and dance, at

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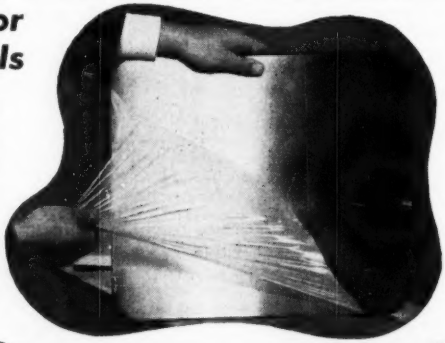
Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.



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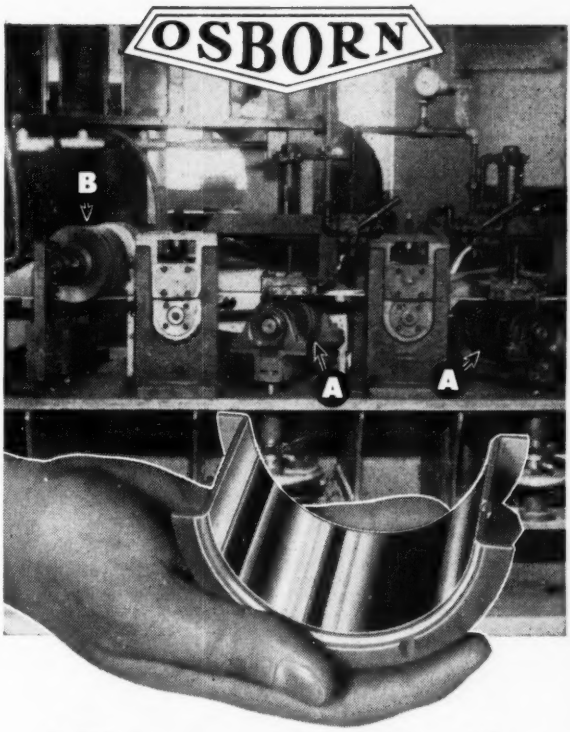


Will "automatic" ideas like these cut your costs?

THIS machine does two jobs at one time . . . does them thoroughly by power brushing . . . at the push of a button.

Perhaps a similar brushing method can help cut *your* costs, boost *your* production and improve the quality of *your* products.

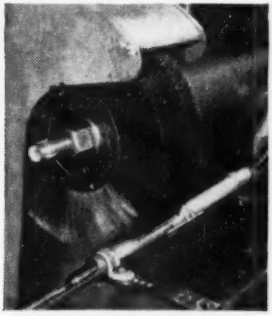
The machine developed with the help of the **O**sborn **B**rushing **A**nalyst cleans steel-backed, babbitt-lined strip for production of automotive sleeve bearings. With the strip traveling continuously, Osborn Master® Wheel Brushes (A) remove all dirt, rust and metal particles from the steel surface. Osborn Monarch® Sections (B) then thoroughly clean the babbitt side.

This is typical of the cooperation which your **O**sborn **B**rushing **A**nalyst can give *you* to solve problems of product cleaning, burr removal, roughing, polishing and finishing. For help, call or write *The Osborn Manufacturing Company, Dept. 0-2, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

SAVES 12 MEN. This is one station of a five-station rotary automatic machine equipped with Osborn power brushes that removes burrs and sharp corners of clutch disc teeth. Formerly done by hand. Saves 12 skilled men.



9 TIMES AS FAST. This simple pipe fixture provides the means of cleaning threads of set screws. Can be applied to many cylindrical parts. Time was cut from 18 seconds to 2 seconds with this Osborn brushing idea.

10 TIMES AS FAST. This shows two gears before and after deburring by a new Osborn power brushing method. Note smooth uniform results. Time was cut from 3 minutes to 18 seconds.

A. E. S. 40th ANNUAL CONVENTION, Benjamin Franklin Hotel, Philadelphia, Pa., June 15 to 18, 1953.

$8.50 per person, may be secured from George Schore, secretary-treasurer, 150 Bennett Ave., New York 33, N. Y.

The **PHILADELPHIA BRANCH**, host branch for the **40th ANNUAL A.E.S. CONVENTION**, is one of the oldest branches in the Society, having been formed September 10, 1910. In the intervening years since its founding, the branch has grown to a membership of over two hundred, and in the interim has assisted in the establishment of the Baltimore-Washington, Allentown-Reading, and Lancaster branches.

The Allentown-Reading and the Lancaster branches are co-sponsors of this year's Convention, an indication that the entire industrial area of Eastern Pennsylvania will be well represented at Philadelphia in June.

The Allentown-Reading Branch is represented on the Convention Committee by Norman H. Miller, and the Lancaster Branch is represented by Harry L. Hovis.

SOCIETIES

The **SECOND ANNUAL INTERIM MEETING** of the **AMERICAN ELECTROPLATERS' SOCIETY** was held Jan. 10, 1953, at the Neil House, Columbus, Ohio. In attendance were the members of the Executive Board, and about 50

The Philadelphia Branch officers are as follows: Standing, left to right; Clarence E. Boerkel, librarian; Paul Mentzer, Sr., board of managers; Samuel Heiman, board of managers; Robert L. Farren, Jr., board of managers; Nat. Verrelle, board of managers; I. William Marcovitch, secretary. Seated, left to right; William H. Trusdell, 2nd vice president; Edwin F. Ottens, 1st vice president; Alfred H. Pope, president; George M. Long, treasurer.

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A typical vapor degreasing installation where thousands of small parts are cleaned in seconds with "Triclene" D.

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Throughout the year, thousands of reports from Du Pont specialists in the vapor degreasing field are studied and evaluated by our research department. This intimate contact with the modern demands of industry has helped guide us in the formulation of "Triclene" D . . . assures you of a rugged solvent that meets modern requirements.

"Triclene" D is stable and pure . . . resists the action of destructive materials which may be present in degreasing. It's the product of over twenty years of research and technical "know-how" in the field. And every drum of "Triclene" D is backed by the Du Pont service organization—experienced men who can help you maintain peak efficiency in every phase of your metal cleaning program.

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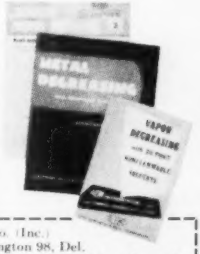

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delegates representing many of the Branches of the A.E.S.

The various officers reported on the current status of the Society, and there was a thorough discussion of future plans for the Society, including its publications, its research program, and its general operation. A meeting of this kind has been found to be helpful in acquainting delegates with many details of the Society's business so that time may be saved in the Annual Meeting held during the Society's Annual Convention.

The accompanying photographs show that the East and Midwest were well represented at this meeting.

Fig. 1—A.E.S. Supreme President Franklyn J. MacStoker addresses the Second Interim Meeting of the Society.

Fig. 2—This view of some of the delegates at luncheon shows President MacStoker and First Vice-President George P. Swift (at left) and (right) George Schore, secretary of the New York Branch, sponsor of the 1954 A.E.S. Annual Convention.

Fig. 3 — Shown here are representatives from the Detroit, Indianapolis, Rockford, and Baltimore-Washington Branches lunching with Executive Secretary D. Gardner Foulke and Al Korbelak, editor of "Plating."

Fig. 4—Shown at this table (left to right) are: Ray Ledford, Chicago; Manson Glover, Boston; Walter C. Dietrich, "Plating"; Paul Glab and Lew Glassner, Chicago; Dr. Samuel Heiman, general chairman of the Philadelphia 1953 Convention Committee; Leonard Weeg, Rockford; and Myron B. Diggin, Newark.

Fig. 5 — I. Wm. Markovitch and George M. Long (left) of Philadelphia, shown here lunching with A.E.S. Second Vice-President Ralph A. Schaefer, Frank Clifton and A.E.S. Third Vice-President Clyde Kelly (right).

Fig. 6—Buffalo Branch delegates Bert Kirchhoff and William Fotheringham (left), meet at lunch with former A.E.S. Presidents William J. Neill (right center) and S. S. Johnston (right).

Fig. 7—Charles Wise (left), Cincinnati, general chairman of the Cincinnati Branch Annual Meeting, is shown discussing it with L. A. Critchfield, Dayton. Robert D. Miller (center), Cincinnati Branch president, is urging W. H. Safranek, Columbus, and A.E.S. Past President C. F. Nixon to attend the Cincinnati Branch Annual Meeting on March 28.

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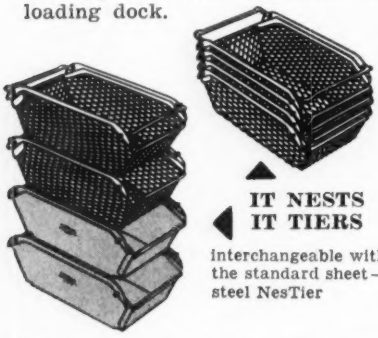

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Now small parts may be routed through every plant operation without changing containers. NesTier baskets serve as flexible stockroom fixtures, may be transported tiered or nested on pallets, are adaptable to roller or overhead conveyors or may be carried easily by hand. Require a minimum of storage space.

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The Chas. Wm. Doepke Manufacturing Co., Inc.
Rossmoyne, Ohio — Metal Specialties Division

A national mobilization survey was recently initiated by the **NATIONAL ASSOCIATION OF METAL FINISHERS, INC.**, 2117 LeRoy Place, N. W., Washington 8, D. C. Copies of survey-data sheets have been sent to 3526 companies engaged in plating and allied finishing processes.

These surveys, which have been conducted for a number of years, not only show the industry's growth but also are facts of proof of its needs. Because of this, they have been presented to the government, its agencies and departments by the leaders of the metal finishers association who were therefore able to obtain recognition of the industry as a vital factor in the nation's economy.

Only because of this information, portrayed in these survey questionnaires, have government and military men been convinced of the necessity of easing NPA Order M-80, Schedule 1, Nickel, and its exceedingly stringent regulations. The amendment to this order, which was recently released, and allows platers to use a nickel strike on all items within the extent of the allowable allocations, shows the success obtained through the use of this information.

To provide further data and keep statistics current, and to make the survey representative of not less than 90 per cent of all operating shops, all companies that have received the questionnaires are urgently requested to complete and return them to Raymond M. Shock, Executive Secretary, National Association of Metal Finishers.

THE PORCELAIN ENAMEL INSTITUTE has elected the following officers for the coming year: W. A. Barrows, Barrows Porcelain Enamel Co., president; H. H. Wineburgh, Textile, Inc., W. N. Noble, Ferro Corp., E. C. Brady, Briggs Manufacturing Co., R. C. Myers, United States Steel Co., R .N. Smith, Temco, Inc., J. A. Holcomb, Wolverine Porcelain Enameling Co., vice-presidents; P. B. Mc Bride, Porcelain Metals Corporation of Louisville, treasurer; E. Mackasek, managing director; and J. C. Oliver, secretary.

HONORS

The Council of the Institute of Metal Finishing announces that on the recommendation of the publications committee, the Westinghouse Brake & Signal Co. Ltd's prize is to be awarded to **W. A. MARSHALL** for his paper on "Non-Elec-

DON'T GAMBLE

on the strength of a wheel

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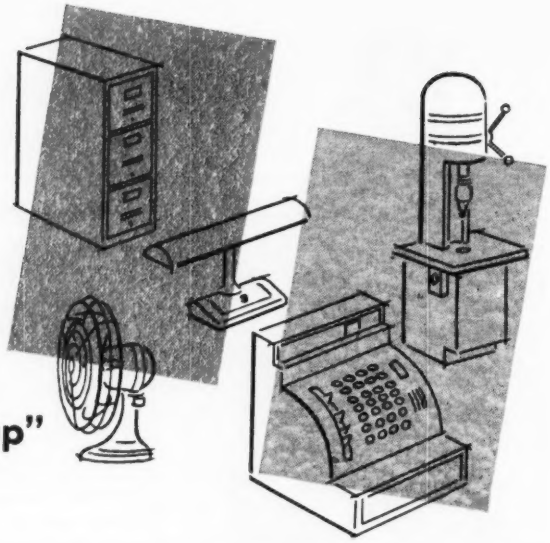
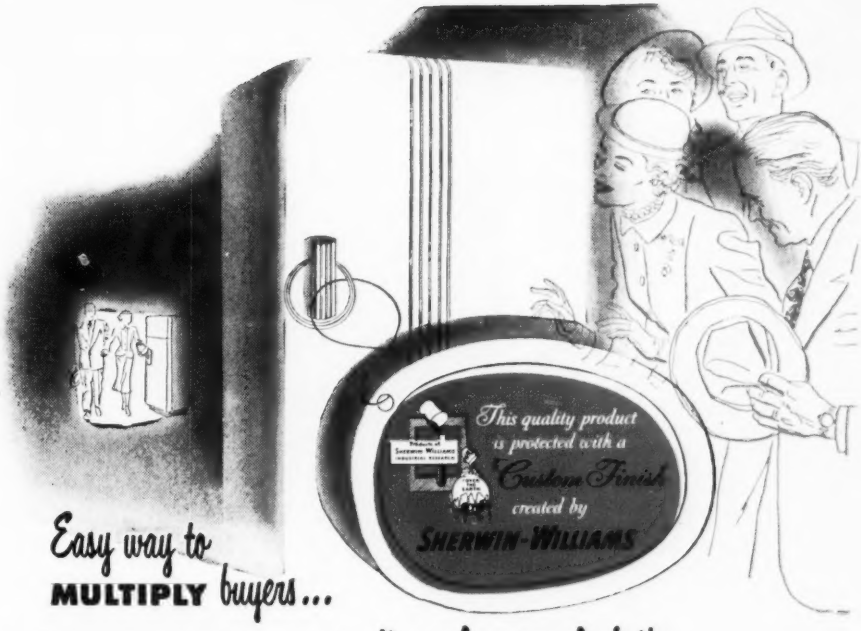


Here's how to get attractive, textured and third dimensional effects . . . conceal surface blemishes, weld marks, minor imperfections. A choice of three ways provides a variety of interesting patterns, infinite shadings of tone—

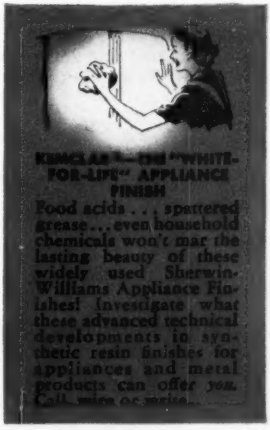
1. **DIMENSO® ONE-COAT "HAMMERED" METALLIC**—Produces a striking 3-dimensional hammered pattern in a single coat.
2. **DIMENSO® ONE-COAT OPALESCENT**—By modifying the method of application, a variety of rich opalescent effects can be obtained.
3. **KEM® ART METAL**—Durable and distinctive nonmetallic wrinkle finishes. Makes possible highly decorative effects.

Get the facts from your nearby Sherwin-Williams Branch. Consult your classified telephone directory for location. Or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

Services of trained industrial finish specialists available in your area through nearest Branch



Easy way to
MULTIPLY buyers...


KEMCLAD — THE "WHITE-FOR-LIFE" APPLIANCE FINISH
Food acids . . . spattered grease . . . even household chemicals won't mar the lasting beauty of these widely used Sherwin-Williams Appliance Finishes! Investigate what these advanced technical developments in synthetic resin finishes for appliances and metal products can offer you. Call, wire or write...

ADD the sales appeal of the BEST-KNOWN NAME IN FINISHES!

ONE good name deserves ANOTHER!

The Sherwin-Williams name, identifying the quality finish on a quality product, contributes the added sales appeal of the best-known name in finishes . . . a trade-mark known round the world as a symbol of good finishes!

That's why market-minded appliance manufacturers, more and more, are looking to Sherwin-Williams Custom Finishes to meet their requirements . . . and to provide an added sales advantage with tags identifying the finish on the completed product.

Ask your Sherwin-Williams Industrial Representative for details about the identification aids available to users of Sherwin-Williams materials, and the sales advantages they offer—or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

John A. Carter (left), president of Oakite, presents D. C. Ball Award to L. T. Prince.

trolytic Treatment for Steel." The prize was formally awarded at the Annual Autumn Meeting at the Grand Hotel, Birmingham, England.

L. T. PRINCE, technical service representative of Oakite Products, Inc., manufacturer of industrial cleaning and allied materials, is here shown receiving the D. C. Ball Award for Distinguished Service from John A. Carter, Oakite president. The award, in the form of a bronze plaque, is presented annually to the member of the firm's nationwide field organization adjudged to have rendered the most outstanding service to industry during the year. Presentation of the award which is given in memory of David Clifton Ball, pioneer in industrial cleaning procedures, founder of the company, and former chairman of its board of directors, was made at a technical-sales conference of Oakite field representatives held recently at the Sheraton Hotel in St. Louis.

Upon the occasion of the annual Christmas party of Maas & Waldstein Co., Newark, N. J., Dr. G. Klinkenstein, president, honored three members of the company who had just completed 25 years of service. The three men; **W. J. GAMBLIN,** supervisor chemist, Laboratory Lacquer Section; **C. F. ROHLEDER,** chief chemist; **E. R. VANDERHOEF,** technical service representative in the Newark area; each received a solid gold wrist watch and a lapel pin signifying 25 years of employment with Maas & Waldstein.

THE DEVILBISS CO., Toledo, Ohio, recently honored 173 of its employees at a banquet in the Commodore Perry Hotel upon their completion of 25 years or more of service with the company.

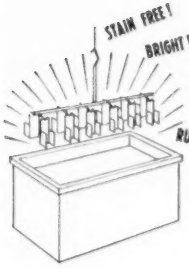
In this photograph may be seen the entire living membership of the Maas & Waldstein 25-50 Year Club. Dr. G. Klinkenstein, president, is standing 8th, reading from left to right.

NEW!

Magic Dry

Your answer to *Trouble-Free PLATING*

by Eliminating { STAINING / DULLNESS / RUSTING



PLATING

MAGIC DRY is a remarkable new product that helps eliminate rejects and increases production. In plating, MAGIC DRY is used in the rinse cycle in concentration of 1-2 ozs. for every 10 gallons of water 180° to 212° F. MAGIC DRY will eliminate plating stains and maintain the bright finish of the plated work. It will also provide a rustproofing finish that will be welcomed by the plating industry.

TUMBLING

Four ozs. of MAGIC DRY per gallon of water applied to tumbled parts at room temperature immediately after tumbling retains the bright finish of the tumbled parts and thereby prevents them from rusting or staining.

MAGIC DRY is now available in 55 gallon drums or 5 gallon containers.

★ ★ ★ ★ ★

Send for a sample of

Magic Dry

and be convinced

★ ★ ★ ★ ★

Mitchell-Bradford

Manufacturers of Black Magic blackening processes, Metal Cleaners, Rust Proofing Oils & Waxes, Heat Treating Salts.

THE MITCHELL-BRADFORD CHEMICAL CO.

2446R MAIN ST. STRATFORD, CONNECTICUT

QUALITY PRODUCTS OF CHEMICAL RESEARCH

The employees automatically became members of the DeVet Club when the 25-year service mark was reached. The membership is now made up of more than 10 percent of DeVilbiss employees. Each member is awarded a diamond-studded service pin upon joining the organization.

ANTON G. CARR, chief chemist and secretary of the National Lacquer and Paint Co. was honored at an informal party in the general offices of the company for fifteen years of service. Paul A. Meyer, president and general manager presented him with a camera.

TRAINING COURSES

THE BINKS MANUFACTURING COMPANY of Chicago has made two important announcements about its **SPRAY PAINTING SCHOOL**. The first concerns an enlargement that allows the school to accommodate a greater number of students. The second concerns the schedule of classes, January through June, 1953.

Classroom facilities have been doubled. The school can now instruct 40 pupils at a time. In addition to increasing the capacity of its school, Binks has also added substantially to the number of visual aids being used. One of the recent additions consists of a sound-slide film explaining the operation of spray painting guns and related equipment.

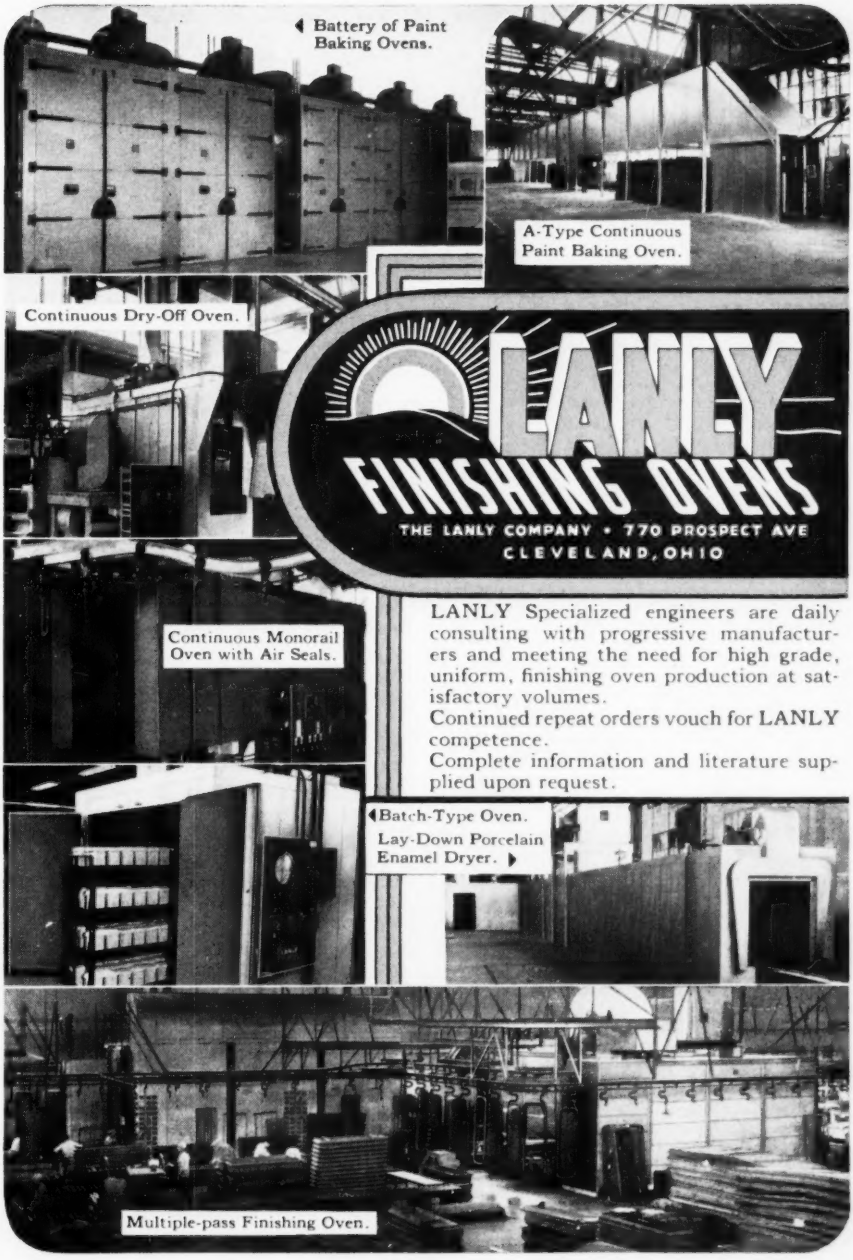
Classes are conducted at the Binks Chicago plant from Monday through Friday. The class dates for the first half of 1953 are:

February 2nd to 6th inclusive;
March 2nd to 6th inclusive;
April 6th to 10th inclusive;
May 4th to 8th inclusive;
June 1st to 5th inclusive.

The Binks Spray Painting School is especially suitable for training officials, foremen, supervisors, distributors or jobber representatives and those who service spray painting equipment. Classes are composed of men with similar interests and similar problems involving spray finishing and coating.

During the 5-day program each member of the class examines and discusses the operation, maintenance and repair of both manual and automatic spray guns.

Mr. Beacham addresses a group of 40 students in the enlarged classroom at the Binks Spray Painting School. A few of the visual aids and pieces of spray painting equipment used during the sessions can be seen.


Battery of Paint Baking Ovens.
A-Type Continuous Paint Baking Oven.
Continuous Dry-Off Oven.
LANLY
FINISHING OVENS
THE LANLY COMPANY • 770 PROSPECT AVE
CLEVELAND, OHIO
Continuous Monorail Oven with Air Seals.
LANLY Specialized engineers are daily consulting with progressive manufacturers and meeting the need for high grade, uniform, finishing oven production at satisfactory volumes.
Continued repeat orders vouch for LANLY competence.
Complete information and literature supplied upon request.
Batch-Type Oven.
Lay-Down Porcelain Enamel Dryer.
Multiple-pass Finishing Oven.

The common causes of faulty spraying are described and methods of avoiding or correcting them are clearly explained.

Men who have never used a spray gun before are taught correct spray painting methods. Trouble shooting gets a lot of attention. Several sessions deal with the automatic spray guns, the heart of any automatic finishing system. Practical applications of spray booths are studied.

By the end of the week, everyone is well acquainted with the construction and operation, not only of spray guns, but also with such important accessories as oil and water extractors, air compressors and portable painting units.

William Beacham, nationally known paint chemist and spray painting authority, is in charge of the classes. Mr. Beacham's broad background of experience as a writer of numerous technical articles and as director of the Binks Customer Research Laboratory will be very helpful to those who have questions about the proper application of specific finishes and coatings.

No tuition is charged. However, each student is expected to pay his own transportation to Chicago and his own expenses while in the city.

Applications from those wishing to attend a session of the Binks school should be made two or more weeks in advance of class dates so that appropriate reservations for hotel and other accommodations can be provided. Write Mr. E. F. Watts, Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Illinois.

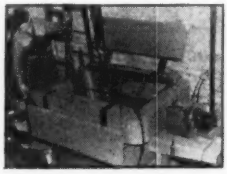
Stock Delivery ON VAPOR DEGREASERS and TANKS

ANOTHER RAMCO PRODUCT

VAPOR DEGREASERS

Manual and Automatic

Complete equipment for: Anodizing, Phosphating, All Plating Processes; to comply with all gov't. specifications.



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VAPOR — SPRAY — VAPOR

Gas heated (thermostatically controlled) vapor spray unit for cleaning electronic equipment. Note the compact exhaust system and heavy duty split cover.

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801 EDGEWATER RD., NEW YORK 59, N. Y.
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meetings

OF INTEREST TO FINISHERS

Feb. 14. New York Branch, A.E.S., Annual Technical Session, Banquet and Dance, Statler Hotel, New York, N. Y.

Mar. 2-6 ASTM Spring Meeting and Committee Week, Symposium on Gloss Measurement, Statler Hotel, Detroit, Michigan.

Mar. 16-20. Ninth Annual Meeting, National Association of Corrosion Engineers, Hotel Sherman, Chicago, Ill. Protective Coatings Symposium.

Mar. 19-20. Annual Meeting, American Hot Dip Galvanizers Association, Cincinnati, Ohio.

Mar. 23-27. American Society for Metals, Western Metal Congress and Exposition. Los Angeles, Calif.

Mar. 28. Cincinnati Branch, A.E.S., Annual Educational Session and Dinner Dance, Hotel Gibson, Cincinnati, Ohio.

Mar. 31-Apr. 2. First International Magnesium Exposition, National Guard Armory, Washington, D. C. Sponsored by the Magnesium Association.

Apr. 18. Annual Technical Session and Banquet, Boston Branch, A. E. S., Hotel Statler, Boston, Massachusetts.

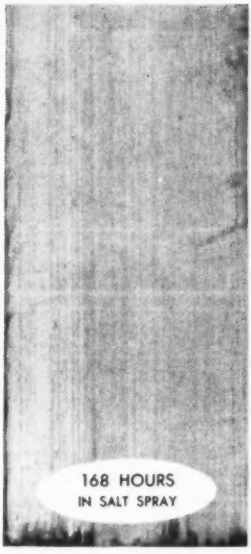
Apr. 26. A. E. S. Thirteenth Regional Meeting, Hotel Taft, New Haven, Conn.

Jun. 15-18. American Electroplaters' Society, 40th Annual Convention. Benjamin Franklin Hotel, Philadelphia, Pa.

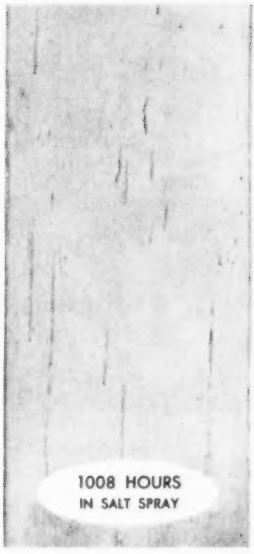
June 29-July 3. ASTM Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

Sept. 21-25. Eighth National Instrument Exhibit, Instrument Society of America, Sherman Hotel, Chicago, Illinois.

Panel of bare 24ST Aluminum, untreated. Extensive corrosion after 168 hours in salt spray.



Panel of bare 24ST Aluminum, treated with Bonderite 710. No corrosion after 168 hours in salt spray.



Panel of bare 24ST Aluminum, treated with Bonderite 710. In excellent condition after 1008 hours in salt spray.

SALT SPRAY TESTS SHOW CORROSION RESISTANCE

ALUMINUM gets increased corrosion resistance, greater durability for paint, with BONDERITE* 710

Here's the surface treatment that practically ends the problem of corrosion on aluminum. Even on high-strength alloys, most susceptible to corrosion, Bonderite 710 protects bare metal for amazingly long periods without failure. Its performance as a base for paint is outstanding.

Bonderite 710 produces an amorphous chromate coating on aluminum surfaces. It can be applied by spray, immersion, or brush, on sheets, castings, forgings and extruded and rolled forms. It operates at low temperatures and is sludge-free.

Bonderite 710 is a liquid—safer and easier to handle, easier to use, more positive in results.

This product's performance equals (*exceeds*, in most important requirements) the government specifications for chemical treatment of aluminum and its alloys.

For bare corrosion resistance, or as a corrosion-resistant base for paint, investigate Bonderite 710 for aluminum.

SEND FOR FREE TECHNICAL BULLETIN—Write today for FREE illustrated bulletin on "Bonderite 710 for Aluminum".

FIRST SINCE 1915
Parker
RUST PROOF COMPANY

2172 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE—corrosion resistant paint base
BONDERITE and BONDERLUBE—aids in cold forming of metals
PARCO COMPOUND—rust resistant
PARCO LUBRITE—wear resistant for friction surfaces

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

New • EQUIPMENT • MATERIALS • PROCESSES

Electric Vapor Degreaser

The DG-1 Degreaser manufactured by J. D. Wallace & Co., 133 S. California, Dept. R, Chicago, Ill., is a portable production unit, electrically-operated, insulated, and thermostatically-controlled.

DG-1 Degreaser

Provided with either a 110 or 220 volt heating element, the degreaser is stated to heat up in less than 20 minutes, and requires only 2½ gals. of solvent.

The caster-mounted base and plug-in feature makes portable operation practical, permitting use of the unit at different work-stations for greater efficiency, lower investment cost, and greater space-savings. The thermostatic control reportedly maintains a constant vapor level and prevents overheating.

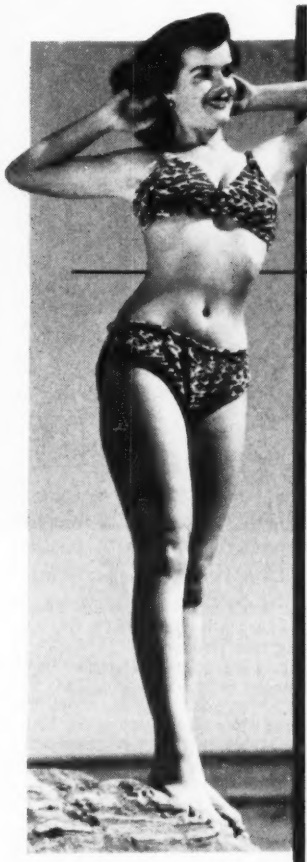
Alkalume Deoxidizing Process

A deoxidizing process, used in preparing aluminum surfaces for welding, has been announced by Northwest Chemical Company, 9310 Roselawn, Detroit, Mich., manufacturer of specialized chemical cleaners.

According to the manufacturer, the process thoroughly removes all soils and oxides without harming metal, thereby reducing surface resistance to a value of 0 to 10 microhms. It is further stated that a resistance of 10 to 20 microhms will persist for many days without reoxidation.

In addition to eliminating mechanical cleaning operations, the method assures more perfectly formed welds, free from cracks at a worthwhile saving in time and cost.

Laboratory tests, made on various alloys and gauges of metal, indicate that the process provides that production welds meet specified values for penetration and shear strength. Welds also aver-



brilliant

In the last analysis, the sale of a specific product in a competitive market may depend largely on sheer Brilliance — of beauty and performance alike. Here, the choice of the perfect coating material may well be a vital factor . . . may provide that extra sparkle of eye appeal that makes sales — and the protection that means satisfied customers and repeat business. In our laboratory, a highly-skilled staff exercises its experience and knowledge to produce just such coatings — that are not only attractive, but durable enough to withstand the toughest test. Your inquiry is invited. . . .

Research, Quality, Service

Affiliate
GORDON BARTELS CO.
Roller Coating Specialists

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS
Manufacturers of Protective and Decorative Coatings

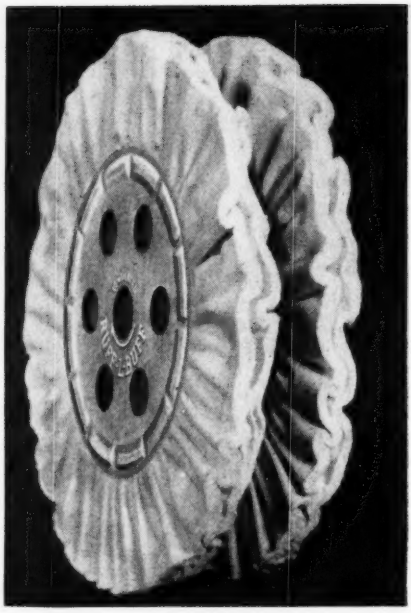
age well above allowable deviation in shear strength. Tests indicate that more welds are possible between tip dressings, and at lower presses. Graphs illustrating performance curves, for various alloys, are now being made available.

Self-Ventilating Buff

The Hanson - Van Winkle - Munning Company, Matawan, N. J., has marketed a self-ventilating buff which makes possible faster buffing and reduced buff wear. The buff, known as Ruff-L-Buff, may be used for hand or machine operation.

When two or more are combined to make up a buffing wheel, ventilating air enters the wheel through holes in the fibre-board centers of the buffs. As the wheel rotates, centrifugal force drives the air through twelve channels between each buff to the cloth portions of the buff where numerous ruffles distribute the air over the buff side and channel it on through the wheel, cooling as it goes.

It is claimed that this makes it possible to operate wheels at higher speeds and to apply greater pressure between the work and the wheel. The net result is faster buffing with less buff wear. The ventilating feature also results in the use of less buffing composition.



Ruff-L-Buff

Cloth used in making the buffs is cut diagonally to the threads. This "bias contruction" exposes to the work the maximum number of thread ends, thus getting more cutting action per revolution. Since cloth cut on the bias does not ravel, buffs wear longer, and also, there is less lint, which means that less buffing composition is wasted.

Other features claimed for the buff are: perfect balance for uniform rotation and wear, steel ring anchor to secure the cloth to the fibre board center, and exclusive Red-E-To-Use face which takes composition immediately without the necessity of evening the buff surface and impregating it with composition.

Ruff-L-Buffs are available in standard and heavy duty weights with outside diameters of 12, 14, 16 and 18 inches. Non-standard sizes on request.

Hanging Hull Cell

The Rohco Hanging Hull Cell, described as being a handy device used to make

Park No. 290
BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

The one and only answer to your exact finishing requirements may be . . .

Randolph HOT SPRAY LACQUERS

Many manufacturers are getting astonishing results—quicker application, fewer coats, speedier production and remarkable savings in costs—by using Randolph's *specially-formulated* Hot Spray Lacquers. Appearance, durability, sales appeal of the product are often improved. Are you sure that your own operation won't benefit in every way from this process?

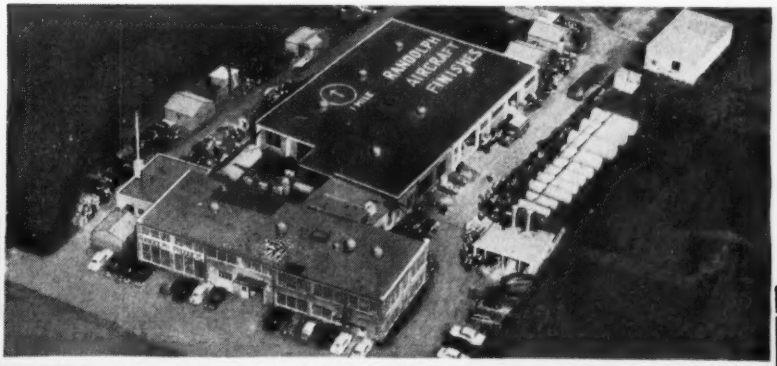
To help you find out, we are launching a customer service program adapted to your individual needs. Simply write us—and we will send a team of experienced technicians to study your methods, demonstrate hot spray techniques and advise as to their desirability in your case.

Randolph Hot Spray Lacquers are now proving the preferable finish for a wide variety of products. Yours may be among them. You can make sure by writing us today!

RANDOLPH PRODUCTS COMPANY

Research Department

CARLSTADT, NEW JERSEY



DOPES · LACQUERS · ENAMELS · THINNERS

tests of a plating solution under actual production conditions, has been announced by R. O. Hull & Co., Rocky River 16, Ohio.

The Hanging Hull Cell may be suspended from the cathode bar of a still or automatic plating tank or machine, and will enable the plater to spot check his plating operation, so that corrective action can be taken at once. The Hanging Hull Cell makes it possible for the plater or process control man to make Hull Cell tests right in the plating room. It supplements the line of Hull Cells, used for tests in a plating control laboratory, also available from the company.

Ionic High Potential Paint Spraying Equipment

Scientific Electric, Garfield, New Jersey, has announced the development of Ionic High Potential Paint Spraying Equipment, which was designed on the principle of charging the paint electrically within the spray apparatus itself. A feature of the system is the Ionic Gun, by which paint is highly ionized so that it differentiates between painted and unpainted surfaces. This is stated to produce an even finish and penetrate into all cavities and crevices. As a consequence, less paint is used in actual operation and product quality is increased significantly, it is claimed. The gun is designed for use with a wide variety of adapters for almost any application.

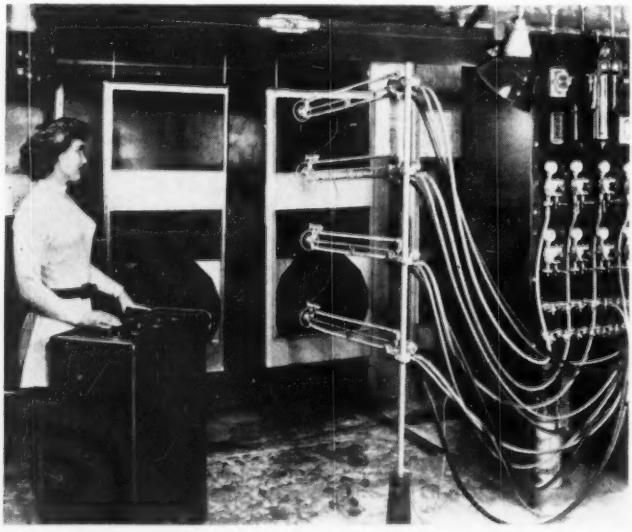
The paint spraying unit includes an Ionic High Potential Power Supply and Control, also recently developed by this company, available in an 80 to 140 K.V.P. range. Installations will accomodate power inputs at all standard voltages.

Twin-Tunnel Metal Washing Machine

A metal cleaning machine featuring a two-in-one space saving design has been announced by Cincinnati Cleaning & Finishing Machinery Company, Engineering Dept., Schmidt Bldg., Cincinnati 2, Ohio.

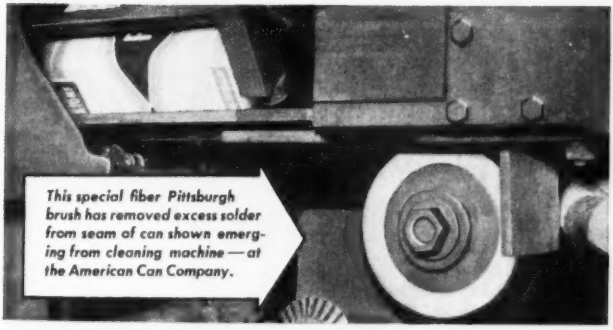
The machine has a tunnel, in which parts carried on the plant monorail conveyor system are washed, above a tunnel through which miscellaneous large and small parts are carried on a wire mesh belt through washing, rinsing and drying operations. Parts on the monorail system are carried through the washing machine without attention, being loaded at the preceeding work station and unloaded at the work station (painting) which follows the cleaning process. Large parts not carried on the monorail are loaded on the conveyor belt section of the washer and manually unloaded at the discharge end. Smaller parts, fragile or difficult to clean, can be processed on the belt, using baskets or racks.

The washing solution, which may have a phosphoric acid base to prepare metal surfaces for painting, is contained in a 3,500 gallon tank. From this tank, two pumps supply solution to the spray arrangements in the respective belt and monorail washing sections. With a



A view of an Ionic-Gun paint spraying installation.

"Wouldn't be without them!" say the men who use . . .



This special fiber Pittsburgh brush has removed excess solder from seam of can shown emerging from cleaning machine — at the American Can Company.

Power-driven Pittsburgh Brushes for longer life, better work!

Last longer, much safer — Cloth brushes formerly used at the American Can Co., Jersey City, to wipe excess solder from can seams lasted less than an hour, occasionally caught fire. Switching to special fiber Pittsburgh Brushes, American Can now gets better than 15 hours life per brush and the fire hazard has been eliminated. Supervisory personnel reports: "We wouldn't be without them!"

Last longer, do better job—In producing wall and ceiling panels, at the Barclay Manufacturing Co., New York City, dust caused by routing "mortar lines" settles on the panels, must be completely removed before panels can be bake-finished. Brushes originally used had a short life span, wore unevenly, and did so poor a job that many baked panels had to be completely refinished to pass inspection. Since even a "fairly good" brush would not do, Barclay searched for the "perfect" brush—and chose Pittsburgh! Result: Better work, and costly refinishing eliminated.

Last longer, better constructed—The Windalume Corporation, Kenvil, N. J., manufacturer of aluminum windows, uses Pittsburgh wire brushes to remove burrs caused by milling. The wire bristles on the brushes used formerly broke off easily. Windalume replaced them with Pittsburgh Brushes because they are better constructed—and Pittsburgh Brushes last longer!

WRITE TODAY FOR FREE BOOKLET!

Write for a free copy of our booklet that shows, through actual case histories, how Pittsburgh can help cut *your* brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W-8, 3221 Frederick Ave., Baltimore 29, Md.

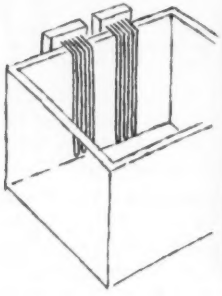
PITTSBURGH *Power Driven* **BRUSHES**

BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

SAVE 6 WAYS
WITH THE NEW
THERMALINK
LEAD SHEATH
ELECTRIC
HEATERS

Standard models cover range of 1000 to 5250 watts



TYPE OB OVER-SIDE HEATERS ALSO AVAILABLE WITH SHEATHS OF COPPER, STEEL, STAINLESS, AND INCONEL

1. Save on first cost. Compare Thermalink's low prices.
2. Save on installation. Elements fit over side of tank, require no fastenings.
3. Save on maintenance. Elements designed to give better, longer service. Have extra thick lead sheaths.
4. Save replacement costs. Should damage occur, heating tubes are individually replaceable.
5. Save space. Occupy minimum tank space. Designed to fit flat against tank wall.
6. Save time. Elements are convenient to handle, require less time to clean.

ASK FOR DATA SHEET OBL-152

ELECTRO-THERM INC.
Electric Heating Elements & Controls
931 SELIM ROAD SILVER SPRING, MARYLAND

mani-folding arrangement, the solution delivered by both pumps can be applied in either spraying section or divided between the two sections in any proportion. A similar arrangement is used in the rinsing section, pumping from a 2,250 gallon tank. Both solution tanks are heated with 90 p.s.i. steam, using removable plate-coils. Float valves maintain solution level automatically.

Air used in drying is heated by a dual setup of mixing type gas burners supplying a maximum of six million BTU's per hour. Burners are completely equipped with safety and temperature control equipment. Two large blowers apply and recirculate the heated air to the parts at a velocity sufficient to strip excess water from the parts, simplifying the drying operation. Here, too, the dual arrangement allows the operation of either or both sections of the washing machine.

The manufacturer states that this arrangement saves floor space, operational cost and investment while it provides more than adequate cleaning facilities for a wide range of items. Basic principles are easily adapted to any size or type of operation.

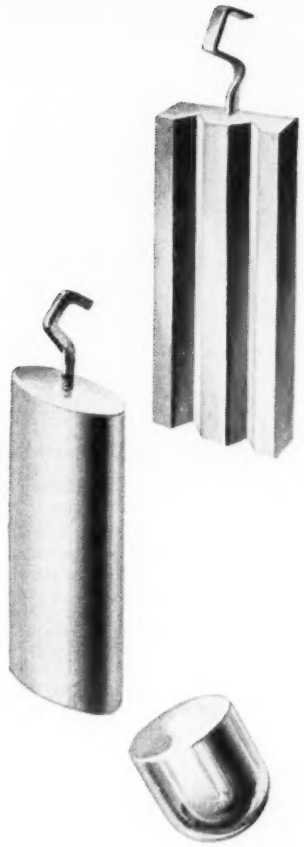
Rustbond Primer

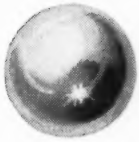
The Carboline Co., 331 Thorton Ave., St. Louis 19, Mo., has announced a paint primer that covers and adheres to rust, acting on it slowly to chemically and mechanically bond steel, rust and primer together. Designated as Rustbond Primer, this material was developed primarily to stop the peeling of polyvinyl chloride finishes from rusty steel. Rustbond Primer contains a new type of vehicle which gives it high polarity, excellent edge coverage and an ability to reduce rust to basic iron.

The manufacturer claims that: Rustbond Primer adheres almost perfectly to rusty steel, or rust or to sandblasted steel surfaces; it covers sharp and rough edges as heavily as flat surfaces; it is unplasticized and it won't burn in an ordinary flame; it possesses good corrosion resistance to most acids and (after aging) most solvents.

Brady Quik-Label Container Markers

A quick and positive method for labeling containers holding hazardous materi-





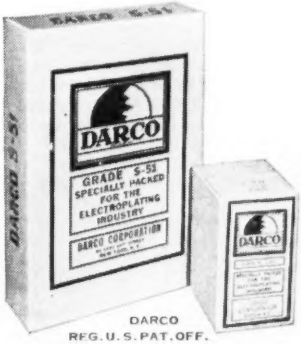
CLEAN BATHS SAVE METAL!

Keep your plating solutions clean—and you'll save on scarce metals three ways. You'll be able to get a better finish with thin deposits . . . you'll cut your loss of rejected pieces . . . and you'll get full use of anode metal.

Start CLEAN . . . *Stay* CLEAN!

Red Label Darco S-51—used regularly—is your best bet for adsorbing harmful impurities from your baths. It has been given a special desulfiding treatment that completely removes the danger of forming harmful metal sulfides which can cause dullness, poor adhesion and brittleness. It wets quickly . . . is particularly easy to mix into slurries.

Your local supplier carries Darco. Order your stock today—and make sure you get Red Label Darco S-51, the activated carbon made especially for purifying plating baths.



DARCO DEPARTMENT

ATLAS POWDER COMPANY

Darco General Sales Offices

60 East 42nd Street, New York 17, N. Y.

Atlas Powder Company, Canada, LTD., Brantford, Canada

als has been announced by the W. H. Brady Company, 776 W. Glendale, Milwaukee 12, Wis.

Known as Brady QUIK-LABEL Container Markers, these labels stick fast to glass, metal, wood, plastic or ceramic containers, without moistening. They're made of strong cotton cloth, and are silicone plastic-coated to resist oil, grease, grime and abrasion. The label surface is not affected by most of the materials the container may hold.

State laws require different hazardous materials to be labeled with the same warning words, such as "Danger, Flammable," or "Vapor Harmful," followed by precautionary instructions, such as "Keep away from heat (sparks) and open flame," "Use with adequate ventilation," or "Avoid prolonged contact with skin." Most Brady Container Markers are printed with these various warning words and precautionary instructions, and have a space provided on each Marker for a Self-Sticking Insert. Each Insert has the specific name of the hazardous material —such as acid, naphtha, lacquer or kerosene—printed on it. Thus with a few Container Markers and Inserts, a variety of labels can be made up right on-the-spot, to identify the contents of different containers.

Brady QUIK-LABEL Container Markers

Brady Container Markers are printed black on a sharply contrasting caution-yellow background. Three 2¼ x 3-inch Markers are mounted on each handy Dispenser Card. The exclusive Brady Starter Strip instantly releases one or all markers for quick application, and can be replaced at will for protection of any unused Markers.

Powerful, direct-connected (no gears), 3450 r.p.m., 100-120 v AC air-cooled motor. All sealed ball-bearing construction. Die-cast aluminum housing, polished. All-position handles. In hand weight only 5 lbs. Insulated with ground wire for wet as well as dry sanding or rubbing. Available accessories—deep contour pads, surface plates, felts, etc. Takes any sheet abrasives—3 covers 4½" x 6½" from standard 9" x 11" sheet.

A time saving quality tool priced so every worker can have one.

Write for Circular

SpeedWay MANUFACTURING CO.
1895 So. 52nd Ave., Cicero 50, Ill.

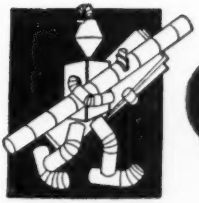
20-RD Sisal Buff

The Geo. R. Churchill Co., Inc., 7531 Fayette St., North Quincy 71, Mass., has announced a sisal buff of finger-type design. Designated as the "20-RD Sisal Buff," the buff consists of many "fingers," each finger being flexible. Thus the entire buff is truly flexible—a feature that is unique to sisal buffs—and is said to be particularly adaptable for work involving curved surfaces and recesses.

A second feature of this Churchill 20-RD Sisal Finger Buff, is the manner in which the sisal itself is manufactured into the buff. Only a specially processed, tightly twisted, first quality sisal twine is used. This is fabricated into each buff finger in such a manner that only the raw ends of the sisal fibres are in contact with the work. Hence cutting compounds are readily picked up and held,

ELECTRICAL OVENS

LARGE or SMALL



- Rack
  - Horizontal
    - Vertical
- Drawer
  - Portable
    - Conveyor

or

Tunnel Drying Types

YOU CAN STAKE YOUR REPUTATION ON THIS OVEN!

Keep a sharp eye on finishing methods for you can stake your reputation on this oven. Excessive heat has been the "cost" of many jobs. Each Young & Bertke oven is designed for its particular job with temperature controls, circulating air fans and other special equipment for perfect finishing results.

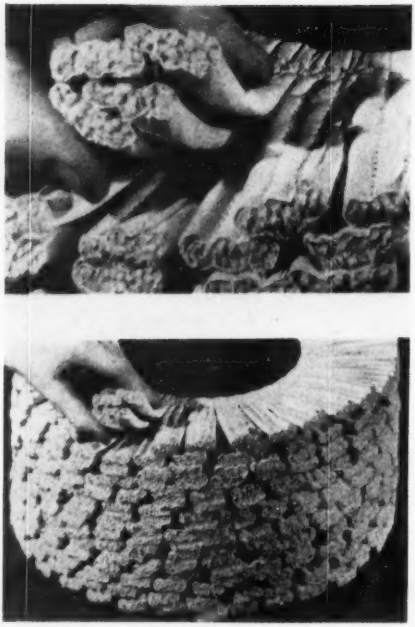
Transformer and Armature coils for radio, television and electric motors are some of the many smaller items to which these ovens are specially adapted. A complete line for results in any industry—for any product—with value beyond expectation. UP GOES PRODUCTION—down go costs.

- For Bonding
- Drying or Baking
- Dehydrating
- Heat Treating
- Preheating

The YOUNG & BERTKE Co.

OVENS • SPRAY BOOTHS • DUST and FUME CONTROL

2291 BUCK ST. • CINCINNATI (14), OHIO



20-RD Sisal Buff

and the tough part of the sisal is the only part of the fibre that is actually doing the cutting. The advantages of this construction are much faster cutting action and longer wearing qualities.

The 20-RD Sisal Buff is produced in all sizes from 6 to 18-inch diameters, for both hand buffing and automatic machines.

Circosonic Ultrasonic Degreaser

A method for fast, efficient degreasing of metal parts has been announced by the Topper Equipment Company, Clark Township, (Rahway), N. J.

The company has developed its "Circosonic" cleaning machine which uses ultrasonic waves to clean metal parts. It removes oil, grease, chips, dirt, lapping compound and many other contaminants from the surface of small precision work pieces at a rate hitherto unobtainable and to a degree of cleanliness that passes the most stringent industrial standards, the manufacturer states.

The heart of the Circosonic Degreaser is the ultrasonic generator developed and manufactured by the General Electric Company. It is used in conjunction with the specially developed Circo Vapor Degreasing equipment and technique.

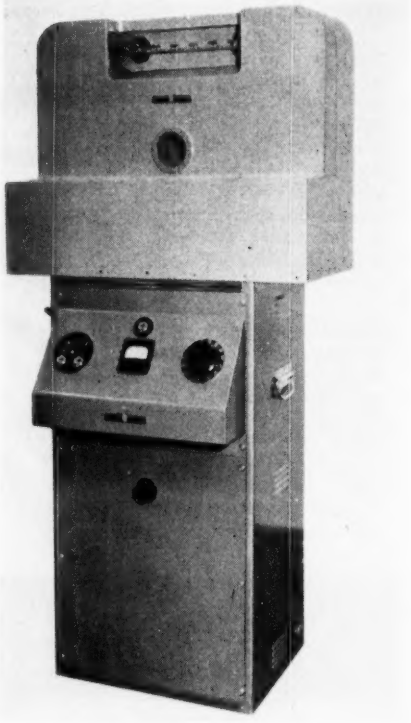
The General Electric ultrasonic generator converts high frequency electrical energy into high frequency mechanical vibration by means of a quartz crystal.

This energy is transmitted up through the cleaning tank. The region above the crystal is greatly agitated, accelerating the normal cleaning action. It is in this zone that the cleaning is accomplished.

After the ultrasonic cleaning action takes place, the parts are rinsed by fresh, clean fluid and quickly dried by the vapor process, emerging sparkling clean.

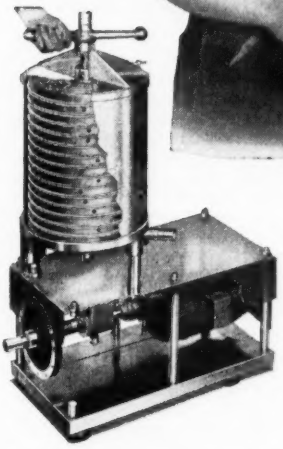
The Circo equipment built around the ultrasonic generator is available in either continuous or batch type design.

Circosonic cleaning is especially effective in removing contamination from complex shapes, corners, cracks and holes.



Circosonic Ultrasonic Degreaser

guard against Rejects



"Sealed Disc" Filters were designed especially for plating rooms. They're smaller, compact, and more portable than ordinary conventional Filters, and they are also performing satisfactory results on many acid dips, electro cleaners, and solvents.

You Can Be Sure With A "Sealed Disc" Filter

More and more cost-minded platers depend on Alsop "Sealed Disc" Filters to remove dirt, dust, and sludge from their plating solutions. They get better finished plated work—they save time and labor, and their plating solutions last longer. The "Sealed Disc" Filter assures positive, trouble-free performance that's proof against even the invisible impurities that cause nodules and porousness—proof against rejects and reworking. There's a "Sealed Disc" Filter "to fit your job"—write for complete information, the Alsop Engineering Corporation, 802 Keen Street, Milldale, Connecticut.

ALSOP ENGINEERING CORPORATION

Filters, Filter Discs, Pumps, Tanks, Mixers, Agitators

Rust-Sol No. 123

Klem Chemicals, Inc., 14401 Lanson, Dearborn, Michigan, has announced a phosphoric acid cleaner in concentrate form for ferrous metals. Designated as "Rust-Sol No. 123," this cleaner can be applied either by brush-on or immersion methods and rinsed off with clear water.

The manufacturer claims that Rust-Sol No. 123 dissolves all surface salts, rust, scale, and so on, from production pieces, neutralizes and activates the surface with a slight etch and iron phosphate coating which makes an excellent base for paint.

Because of its neutralizing action, this cleaner can also be used following alkali stripping or cleaning.

Rust-Sol No. 123 is non-toxic, non-flammable and non-volatile. It emits no corrosive fumes and can be used safely anywhere in the plant, it is claimed.

Acme Greaseless Composition

The Hanson - Van Winkle - Munning Company, Matawan, N. J., has introduced a buffing and polishing composition known as Acme Greaseless Composition. The composition is claimed to adhere strongly to the wheel face to form a heavy, fast drying head which does not fly off and remains firm even in the warmest weather. It also features a consistently-sized abrasive. Particles of exactly the same size act upon all parts of the work to produce a uniform finish.

Acme Greaseless Composition

Acme Greaseless Composition may be used on brushes and buffing wheels and for hand buffing. It is stated to give excellent results in cutting, polishing, deburring or satin finishing all metals. The composition is available in aluminum tubes and in foil-lined cardboard cartons.

FUNCTIONAL FINISHES!!

If you require your coatings to accomplish some specific task — something beyond mere ornamental appearance or average longevity —

Try Us!

We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

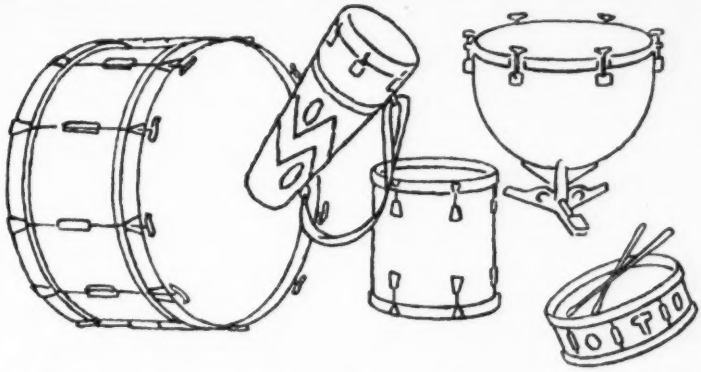
The Varnish Products Co.

5204 Harvard Avenue
Cleveland, Ohio

Crown Pebs

The development of Crown Pebs, a tumbling media for barrel tumbling, deburring, and finishing, has been announced by Crown Rheostat & Supply Co., 3465 North Kimball Ave., Chicago, Ill.

Made of tough white ceramic, these Pebs are of uniform size and triangular shape. They are available in a variety of sizes. The manufacturer claims that the wear resistant ceramic used in the manufacture of Pebs insures a service life several times longer than either natural stones or aluminum oxide type of tum-



All drums look alike!

We've a point to make — one drum of chemicals looks like the next and there is no practical way for you to prejudge the ability of a drum of chemical to do the job you require. For the most part, chemicals are bought on confidence — on the recommendations of responsible chemical suppliers and their engineers

For 10 years Klem Chemicals, Inc. has served important large and small manufacturers of production parts and products. Klem has analyzed countless unusual conditions and successfully produced compounds that have enabled industrialists to eliminate bottlenecks and establish profitable production schedules. Klem has also developed many standard formulae for meeting tough, but not uncommon conditions.

Klem's business has grown on the strength of confidence in their ability to solve problems.

KLEM PRODUCT of the MONTH

STRIP-AID No. 176

Save 50%, add low percentage to your stripper — get fast one-step action. Save materials, labor, heat — salvage rejects, strip accumulated paint from hangers, dollies, at low cost. Write for details.

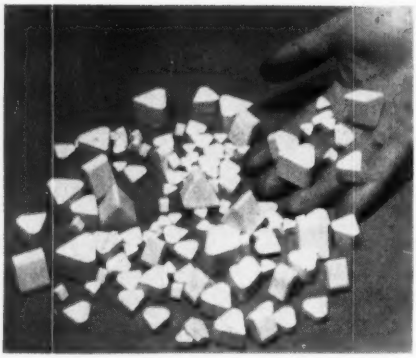
3 OF 20 STANDARD KLEM PRODUCTS

KLEM KOTE No. 240—A new and superior phosphate coating for metal surfaces, assuring better paint adhesion.

BOOTH KOTE No. 69—Coating for dry spray booths—non-inflammable, non-flaking. Provides easy peel-off of accumulated paint.

RUST SOL No. 113—An easy wipe-off process for cleansing and preparing steel for painting. Dissolves oil, soil, rust, etc. Neutralizes surface.

KLEM Chemicals Inc.
14401 LANSON . . . DEARBORN, MICHIGAN



Triangular Ceramic Crown Pebs

bling chips. Pebs, it is reported, can be quickly and easily screened to separate one size from another, and from the work being processed.

Durez Phenolic Plastics for Electroplating

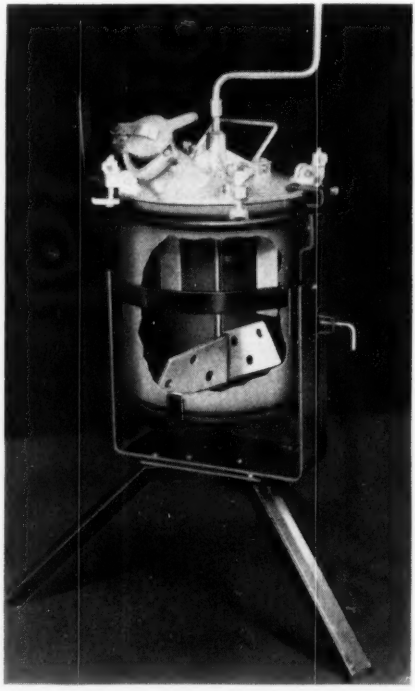
A new type of conductive phenolic plastic has been developed by Durez Plastics & Chemicals, Inc., North Tonawanda, New York, which has the unique property of making electroplating adhere tenaciously. Plastic articles can now be plated directly by conventional means after merely sand blasting or vapor blasting the molded surface. The fact that the material is conductive eliminates the necessity of first applying expensive silver coatings. The adherence between the electroplating metal and Durez phenolic is outstanding. Nickel, for example, will plate with a bond strength of over 2,000 pounds per square inch.

Plated surfaces can be vigorously buffed without causing blisters or pulling off the metal from the plastic. Plastic articles that have been plated with nickel will withstand repeated exposures to dry ice and boiling water without showing any signs of failure. It is no longer necessary to envelop the whole plastic part in metal in order to assure that no separation will take place. The fact that this plastic has excellent corrosion resistance means that the exposed metal surfaces are not subject to pitting and bleeding troubles so common when metals with poor corrosion resistance are plated. All tests which have been run so far to evaluate resistance to outside weathering have been exceptionally good.

Prop Industrial 5-Gallon Mixer

The PROP "Industrial" Mixer, manufactured by Marien Metal Products Co., Inc., 1220 E. Nine Mile Rd., Hazel Park, Mich., fits all 5-gallon paint pails and clamps securely to the bead. Neoprene gaskets and machined spout cover are water-tight, thus permitting horizontal positioning for both stirring and dispensing. The cover is cast aluminum fitted with an oilite bearing.

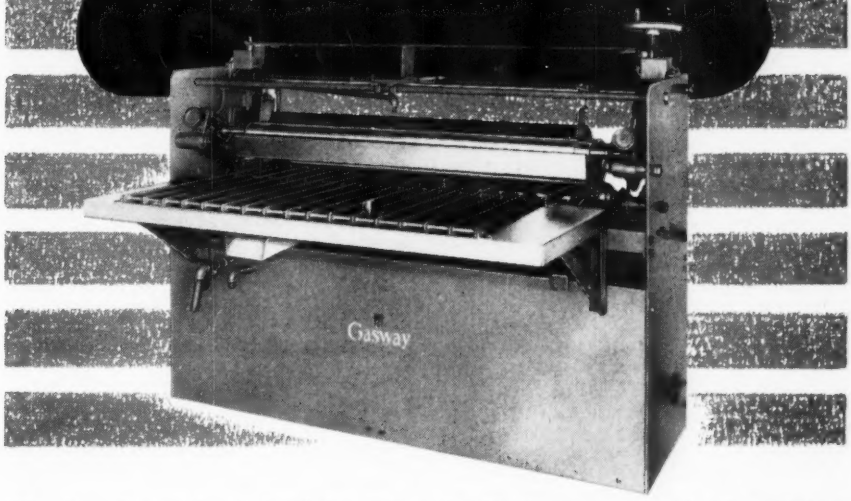
The manufacturer claims that the ½-inch shaft and ¼-inch pitched blades will move the heaviest settled paint. Two baffles extending downward and just clearing the blades produce a tumbling motion of the contents without aeration. The blades cover the entire bottom of the



Prop Industrial 5-Gallon Mixer

Rollacoat for economy

GET FINER—FASTER FINISHING!



The benefits to be gained by using the Rollacoat method of applying finishes and protective coatings, to practically any type of flat materials, are three-fold. In the first place coating speeds are greatly increased over those of any other method and are governed largely by how fast the coated materials can be handled or dried. Secondly, the coverage per sq. ft. per gallon is usually at least 50% greater, the only loss being the paint removed from the rolls at the end of a run. In the third place you obtain finer quality of finish due to accurate control of thickness and eveness of coat.

The applications of Rollacoating are numerous. Top, bottom and sides of practically any type of flat material, whether sheet or coil stock, can be coated by a single pass through the machine.

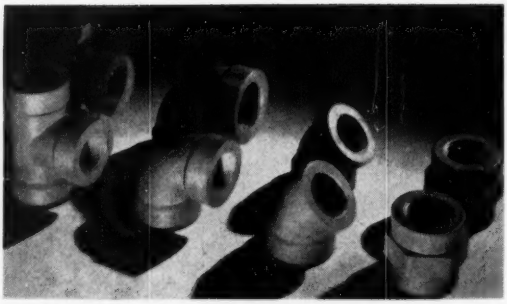
Special equipment for cleaning, treating, coating, drying, and rewinding strip in continuous process can be constructed to special order.

GASWAY CORPORATION

Write or wire today for the 12 page Gasway illustrated book describing Rollacoat Finishers, their possibilities and limitation.

6463 N. Ravenswood Ave.
Chicago 26, Illinois

Boltaron 6200 Pipe Fittings



pail and bring up all the heavier material into the mixture.

It is recommended that a PROP be attached to each pail in use, thereby assuring dust-free protection and readiness for stirring before each pouring. As the pail is emptied, the PROP is transferred to a fresh pail of the same color, although cleaning is a simple matter if another color is to be stirred.

A combination cradle-dispenser constructed of heavy gauge steel with baked enamel finish is also available to be used in conjunction with the agitator. It is self-locking in three positions for stirring, pouring, and draining. By removing legs, it can be bench mounted.

Boltaron 6200 Pipe Fittings

H. N. Hartwell & Son, Inc., Box 32, Boston, Mass., exclusive distributor of rigid non-plasticized BOLTARON 6200 Polyvinyl-Chloride announced the development of threaded I.P.S. pipe fittings (tees, 45 and 90-degree elbows and couplings) molded of this corrosion-resistant material.

The fittings, in ¼ to 2-inch sizes, are now carried in stock for use with Boltaron pipe for best results in overcoming corrosion problems. Pipe in sizes to match is available in 10 and 20-foot lengths and can, of course, be threaded using ordinary pipe dies.

The manufacturer points out that Boltaron 6200 has found increasing use throughout the chemical industry because of its outstanding resistance to organic and inorganic acids, alkalis, alcohol and foodstuffs. It is said to retain the unmodified properties of pure polyvinyl chloride, superior with respect to greater hardness, toughness and rigidity.

PRODUCT LITERATURE

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

Automatic Rack Type Plating, a bulletin prepared by Frederick B. Stevens, Inc., Detroit 16, Mich., gives complete descriptions and illustrations of the Stevens automatic rack type machines.

Many of the special applications that these machines are capable of handling, such as heavy duty cleaning and pickling and automatic bright dipping, are illustrated.

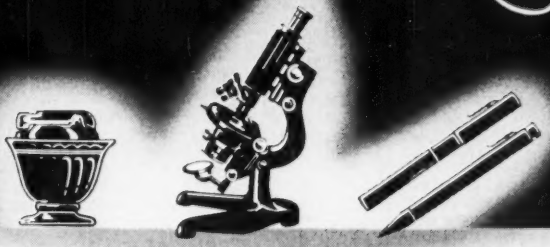
ANNOUNCEMENT

The Masters Electro-Plating Association, Inc.
59 East 4th St., New York 3, N. Y.

35th Annual Banquet, Saturday, April 11, 1953
Belmont Plaza Hotel, NYC

Cocktails: 7 p.m. ***Banquet: 8:30 p.m.***

Rhodium Plating



Rhodium is one of the six platinum group metals. It is hard and has an untarnishable brilliant white color. In electroplating, it produces beautiful results and is widely used for this purpose in jewelry — even precious metal jewelry. Its high reflectivity makes it excellent for mirrors for motion picture projectors and similar purposes. With restrictions upon usual plating metals, rhodium is the logical alternative for plating optical mounts, contacts for communication equipment, radar components, pen and pencil sets and a host of like objects.

Commercial rhodium plating was developed in our laboratories.

BAKER & CO., INC.

113 ASTOR STREET, NEWARK 5, N. J.

NEW YORK • SAN FRANCISCO • CHICAGO

Let us send you "Directions for Rhodium Plating."

ASTB Folder. Eighty different methods for testing, inspecting, and analyzing some ninety different types of products are listed in a folder being distributed by American Standards Testing Bureau, Inc., 44 Trinity Place, New York, N. Y.

Prepared to show industry and business the scope of services available to them for the quality control of many products, several methods are touched on briefly, such as non-destructive testing; testing for performance, corrosion resistance, protective coatings; chemical analysis; development of specifications; product certification; and the seal of approval.

Emphasis is placed on the facilities that make it possible to perform many of these services in the field, in the client's plant or at the Laboratories of American Standards Testing Bureau, Inc.

"Vinlite" Resin VMCH for Coatings. The latest technical information on specifications, formulations and uses of Vinlite Resin VMCH as a surface coating is presented in Technical Release No. 12, a new 16-page booklet published by Bakelite Company, a Division of Union Carbide and Carbon Corp., 300 Madison Ave., New York 17, N. Y.

Addition of plasticizers, stabilizers and solvents and their effects on resin VMCH are discussed in the pamphlet. Resin VMCH itself is suggested for use as a blending agent to impart improved adhesion characteristics to other vinyl chloride-acetate resins. The booklet outlines proper methods of selecting and using pigments with regard to reactivity, dispersion, and mixing of these colorants with the resin. Several applications of Vinlite Resin VMCH are also described in Technical Release No. 12.

Bulletin DB-32-52. Induced Draft Bifurcator Fans are the subject of a catalog issued by DeBothezat Fans Division of American Machine and Metals, Inc., East Moline, Ill. It contains illustrations, specifications and dimensions of Induced Draft Bifurcator Fans in 24 sizes, for high pressure boilers delivering up to 60,000 pounds of steam per hour and for low pressure boilers rated up to 190,000 EDR.

Life is Good in Kalamazoo. This attractively printed, clearly illustrated 12-page booklet, published by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich., presents a word and picture story of Kalamazoo, covering its cultural and business opportunities and listing pertinent facts such as geographical location, population, climate, industrial and commercial power, water, tax structure and government, market, city planning, labor, distribution facilities, financial institutions, agriculture, airport facilities, newspaper, radio facilities, theaters and so on. Two pages are devoted to short descriptions and pictures of products manufactured in Kalamazoo, "The City Hammond Calls Home."

Bulletin Sheet No. 300. A three-page leaflet issued by Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y., explains the process of tin-nickel plating, describing the plate and listing the advantages of the process. Recommendations as to type of equipment, directions for preparation of solution and preparation of work, and operation and control are covered.

McKeon's

"Liquid Sulphur"

FOR COPPER STRIPPING NON-DANGEROUSLY

Economical, Non-Electrolytic.

No special equipment required.

Write for descriptive brochure.

Sulphur Products Co., Inc.

GREENSBURG 8, PA.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Demineralized Water. The Research Department of the Barnstead Still & Sterilizer Co., 130 Lanesville Terrace, Forest Hills, Boston 31, Mass., has prepared an informative, eleven-page report on the **Uses For Demineralized Water** together with a Water Analysis Study. This report gives information on the uses of demineralized water and points up the advantages of demineralized water in manufacturing and processing operations.

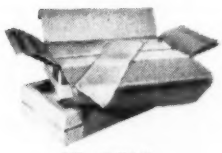
Unichrome Product Finishes. An attractive two-color, four-page illustrated folder is available from United Chromium, Inc., 100 E. 42nd St., New York 17, N. Y. The folder lists the various Unichrome coatings available, grouping them under the following headings: clear enamels, lacquers, varnishes to protect bright work; lightfast finishes to simulate colored metals; special chemical resisting pigmented coatings; heavy duty coatings with substantial thickness. A number of product applications are cited, enabling the prospective coating user to visualize the wide range of finishes supplied by the company.

Bay State Grinding Wheels. The Bay State Abrasive Products Co., Westboro, Mass., has available a folder listing the specifications and setting forth the advantages of their vitrified wheels. Sketches illustrating the recommended directions for use in grinding are included.

Electroplating Large Complex Shapes. Available from International Nickel Co., Dept. EZ, New York 5, N. Y., is a 4-page, illustrated article which points out that the modern plating plants, making the utmost use of chemistry, electrochemistry, plating engineering and plating "know-how," are successfully electroplating nickel on large, complex equipment up to 700 square feet in area. For handling corrosive materials, heavy electroplated metallic coatings will supplement, or substitute for, clad metals, wrought metals and alloys not only as a means of conservation but, in many cases, as an economic measure. This is particularly true where a large number of pieces of the same size and shape are required. Design factors, welds, preparation and plating methods are discussed.

For Dust Free Finishes!
BOND TACK CLOTH

IN ROLLS
Cut off any size piece to use as needed.



IN BULK
Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available in Rolls or Cut Bulk—White or Gold In Three Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up!

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free* and *Wax-Free*. Gives a sparkling speck-free Finish *every time*. Clean and sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

BOND CHEMICAL PRODUCTS CO.
"The Tacky Wiper Specialists"
2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON

Blue M Con-Wate Oven Bulletin 321. Available from Blue M Electric Co., 306 W. 69th St., Chicago 21, Ill., is a bulletin describing the Con-Wate Oven which provides a constant weight of air circulation at all temperatures. It thus insures greater overall oven efficiency, faster heating and more uniform specimens. This and other features and advantages of the Con-Wate are fully described in Blue M's Bulletin 321.

Bulletin 637 issued by Aget-Detroit Co., Dept. PF, Ann Arbor, Mich., describes how the dust from 27 grinding wheels in the toolroom of a leading manufacturer of compressors is being controlled by a standard, pre-tested Dustkop Dust Collector. It also gives the principal specifications of the Model 90N50 collector.

Bulletin 125. Kelite Products, Inc., 1250 North Main Street, Los Angeles 12, Calif., now has available Bulletin 125, which describes and depicts the Kelite Power-Master steam cleaning machine. The colored brochure pictorially presents the many applications of the Power-Master which has a rated steam capacity of 300 g.p.h. Also included are specifications and installation requirements.

Circo Metal Cleaning Equipment. A four-page bulletin describing and illustrating Circo metal cleaning equipment, vapor degreasers, vapor spray degreasers, liquid-liquid-vapor degreasers, pit type and conveyorized degreasers, has been issued by the Topper Equipment Company, Clark Township (Rahway), New Jersey.

Many features of the Circo line are described in the bulletin, such as all equipment being suitable for operation with either perchlorethylene or trichlorethylene degreasing solvents. Also described are the company's recovery stills, power spray washers, portable hydro-spray cleaners and degreasing solvents.

Solvents in Hot Lacquers. Technical Bulletin No. 2 issued by the Shell Chemical Corp., 500 Fifth Ave., New York 36, N. Y., shows the viscosity effect of blending high boiler solvents with methyl isobutyl ketone, as well as the practical evaluation of selected hot lacquer systems. The exact composition of the solvent formulations, used in developing the viscosity data contained in the booklet, are given. Included also is a list of test methods used to evaluate hot lacquers.

"3M" Adhesives, Coatings and Sealers in Industry, an 8-page booklet, available from Minnesota Mining and Manufacturing Co., 411 Piquette Ave., Detroit 2, Mich., describes and pictures 25 various industry-wide uses for the material. It shows adhesives for holding plywood to metal, rubber to metal, and vinyl to wood; coatings for anti-corrosion protection, smoothness and safety; and sealers for fuel tanks, auto windshields, and aircraft canopies. It also describes and lists complete technical information on 26 of the firm's chief adhesive, coating and sealer products.

Acid Derusting and Descaling Compound. Enthone, Inc., Dept. PF, 442 Elm Street, New Haven, Conn., has produced a three-page pamphlet describing their **Descaler 2A.** Information covered by the pamphlet includes types of containers suitable for use with the product, concentration, temperature, operation and control.

Rhodium Plating Booklet. "Rhodium Plating Directions," is the title of a handy, pocket-size booklet being distributed by Baker & Co., Inc., 113 Astor St., Newark 5, N. J.

The booklet explains the rhodium plating process in full, listing information on preparation of work, cleaning, preliminary plates, bath makeup, solution maintenance, and practical hints for platers.

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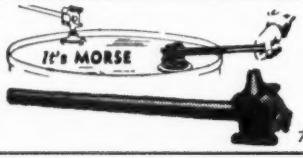

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Oakite CrysCoat Process. An illustrated leaflet describing 19 advantages of the Oakite CrysCoat Process, which is described as eliminating the need for separate cleaning and phosphatizing operations, is available from Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

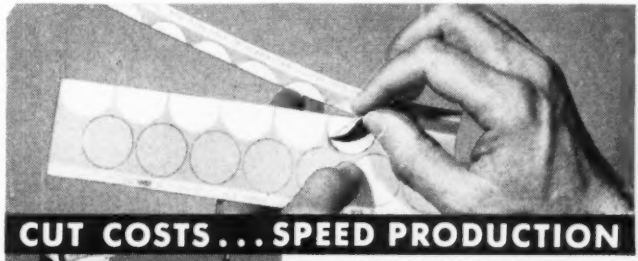
The CrysCoat Process is described in full, as well as its application as a prepaint treatment and conditioner for metal. Equipment requirements, solution control, and typical applications are outlined.

Metal Spraying. A twelve-page catalogue which is well illustrated with photographs of applications of Metalweld's protective coating, rubber lining, metal-spraying, welding and sandblasting is available from Metalweld Inc., 26th & Hunting Park Avenue, Philadelphia 29, Pa.

A detailed discussion of industrial maintenance service is included together with descriptions of jobs which can be performed by the company.

Detrex Degreasers. A 16-page, well illustrated booklet which describes the complete line of Detrex degreasers is available from Detrex Corp., Box 501 Detroit 32, Mich. Different types of degreasers are shown with various conveyors, and some discussion is devoted to degreasing solvents. Also illustrated is the Detrex Industrial Dry Cleaning Process for cleaning wiping rags or shop garments, and solvent stills.

Worklon Folder. Apparel made of Worklon Industrial Acid Resistant Du Pont Orlon, and Sanforized cotton is fully described in a 16-page, two-color, illustrated catalog issued by Worklon, Inc., Dept. U-D, 253 W. 28th St., New York 1, N. Y. The folder lists the garments available, describes the material from which the garments are made, and presents case histories from users of the garments.



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Pickling Bulletin. "**Efficient Pickling With Rodine,**" is the title of **Bulletin No. 13, 1952** edition, issued by the American Chemical Paint Co., Ambler, Pa. The 80-page, illustrated, bulletin was first issued in 1924, and revised in 1937, 1944, and 1952. The chapter headings show that, in scope, Bulletin 13 is actually a manual on the subject of pickling. Included in the bulletin are complete discussions of the following subjects: "Pickling and Some Other Uses of Acid," "Pickling Process," "Rodine," "Pickling Process With Rodine," and "Suggested Practice for Pickling Typical Products."

Thermometers with Pneumatic Control. Specification Sheet 612 describes Brown Indicating and Recording Thermometers with pneumatic control. Construction and engineering details are included. It is available from the Minneapolis-Honeywell Regulator Company, Industrial Division, Station 64, Philadelphia 44, Pa.

Solvent Selector. Available from Carbide and Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y., a solvent selection sheet listing many types of solvents, couplers, diluents, and plasticizers, and for each a breakdown of the molecular weight, the boiling ranges (initial point and end point), the relative evaporation rate, viscosity, flash point, median specific gravity, average pounds per gallon, expansion coefficient, dilution ratio, solubility, and other important information, depending upon the material listed.

For convenience, the back page contains four quick reference tables showing the boiling point, vapor pressure, blush resistance, and relative evaporation rate of various chemical and commercial mixtures.

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Over-side Immersion Heating Elements. Data Sheet OBL-152, available from Electro-Therm, Inc., 931 Selim Road, Silver Spring, Md., describes the electrical heating elements supplied by the company for use in nickel plating solutions, copper plating baths, mild acids, and other metal processing chemical solutions. The two-color, illustrated Data Sheet presents full specifications for the various sizes of heating elements, describes the products, and includes installation and maintenance instructions.

Complete Finishing Systems. George Koch Sons, Inc., 2112 Pennsylvania St., Evansville 4, Ind., has available a four-page folder listing some of the typical users of Koch industrial equipment, and illustrating the layout and describing in detail one of the porcelain enameling systems, and one of the metal preparation and systematic finishing systems produced by the company. Pictures and pertinent information regarding various features of the systems are given. Also pictured are the Koch cabinet oven, the S-42 truck oven, wet spray booth, dry spray booth, cylinder washer, and pilot pickling machine.

Ebonol "C." An operating instruction sheet on the Ebonol "C" Process is available from Enthone, Inc., Dept. PF, 442 Elm St., New Haven, Conn. Information included in this sheet pertains to alloys that can be blackened, the procedures, the concentration, and allied processes.

DuBois Company, Cincinnati 3, Ohio, manufacturer of industrial soaps and cleaners, now has available a group of illustrated articles designed to help solve spray booth problems.

In "**Problems of Spray Booth Operation,**" such subjects as booth design, waterwash booth compounds, skimming, foaming, and testing overspray for reclaimability are covered.

"**Developments in Spray Booth Operation**" takes up some of the new problems facing the spray booth operator. Also available is a practical, concise guide to spray booth maintenance, including a tested check-chart that shows what to do daily, weekly, and monthly. "**Recommendations for Compounding, Marking and Purging of Wet Paint Spray Booths**" contains specifications for the proper selection and use of DuBois' spray booth products.

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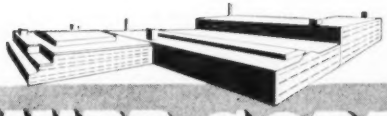

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Bulletin 108. A four-page folder available from Cambridge Wire Cloth Co., Cambridge 9, Md., illustrates the nine basic weaves of wire cloth manufactured by the firm and pictures some of the special metal fabrications the firm has produced. Pictured also are "gripper" slings, another product of the company.

Magnesium Finishing. A revised edition of the manual on finishing systems for magnesium products, is available from the Magnesium Department, The Dow Chemical Company, Midland, Mich.

The 128-page manual describes in detail surface stability, and surface treatment, including cleaning, mechanical finishing, chemical treatments, electroplating, painting, and assembly protection for various magnesium products.

"Baker & Adamson Metal Fluoborate Solutions" is the title of a 20-page brochure now available from the General Chemical Division, Allied Chemical and Dye Corporation, 40 Rector Street, New York 6. N. Y. The booklet is well illustrated and outlines how fluoborate plating solutions are being used in various applications to speed out-put, cut operating costs and save scarce metals.

Also included in the brochure are data on the various chemical and physical properties of the B & A Fluoborate concentrates.

Catalog No. 715. "Complete Vacuum Processing Systems," published by the F. J. Stokes Machine Co., 5500 Tabor Rd., Philadelphia 20, Pa., describes, pictures and gives complete specification tables of many types of vacuum equipment widely used in industrial processes, in private and government laboratories, and in schools and universities throughout the world. Included are rotary and rotating vacuum dryers, vacuum shelf dryers, freeze-drying equipment, impregnators, extraction and solvent recovery apparatus, and vacuum pumps.

Chlorination Topics, Vol. 6, No. 1, published by Wallace and Tiernan Co., Inc., 11 Mill St., Belleville 9, N. J., features an article entitled, **"Handling Chromium Waste in a 'Batch' Treatment Plant."** This is the second in a series of articles on the disposal of toxic chromium wastes.

Bulletins on Dry Process Tumbling Barrels. Designated as **Bulletins LS-52** and **XL-52,** Tumb-L-Matic, Inc., 4510 Bullard Ave., New York 70, N. Y., offers two new bulletins on its line of LS Tumbling Barrels for cutting down, deburring, definning, dry burnishing and polishing metal and plastic parts.

Detailed information is given on barrel sizes, drives, controls, and liners. Photographs show two and three-compartment models and illustrate overhead and floor-mounted drive methods. A specification table gives standard model numbers, dimensions, and number of compartments per barrel. Also included are recommendations for specific abrasive compounds to use in the various tumbling operations.

Bulletin No. 26, entitled, **"Purification of Metal Salt Solutions,"** has been produced by the Research & Development Department of the Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, New York. Some of the topics covered by the bulletin are electrolytic nickel plating—purification of process solutions with H_2O_2, beryllium production—purification of process solutions with H_2O_2, magnesium production—purification of process solutions with H_2O_2, phosphatizing—control of process solution with H_2O_2, and tin recovery with H_2O_2.

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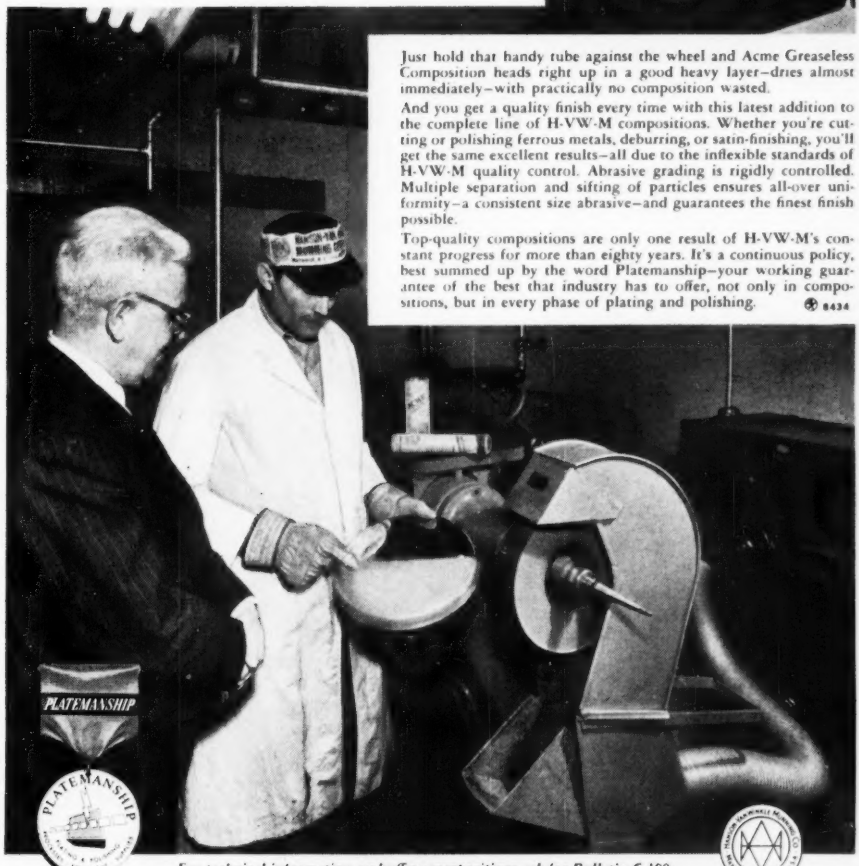

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Reflectance Test for Opaque White Porcelain Enamel. Published by the Porcelain Enamel Institute, 1010 Vermont Ave., N. W., Washington 5, D. C. Price, $0.25.

This revised bulletin (T-13) was prepared by the Institute's Quality Development Committee. It covers apparatus, standards, and procedure, and includes a diagram showing the interrelation of reflectance, reflectivity, and opacity. Tests for both wet-process and dry-process porcelain enamels are described.

Indestructible Plastic Products is the title of an illustrated catalogue distributed by the New York Belting & Packing Co., 1230 Ave. of the Americas, New York 20, N. Y. The catalogue describes fully the characteristics of the plastic material, lists the forms in which it is available, and presents data concerning pipe and fittings, extrusions, and tanks and fume ducts made from Indestructible Plastic.

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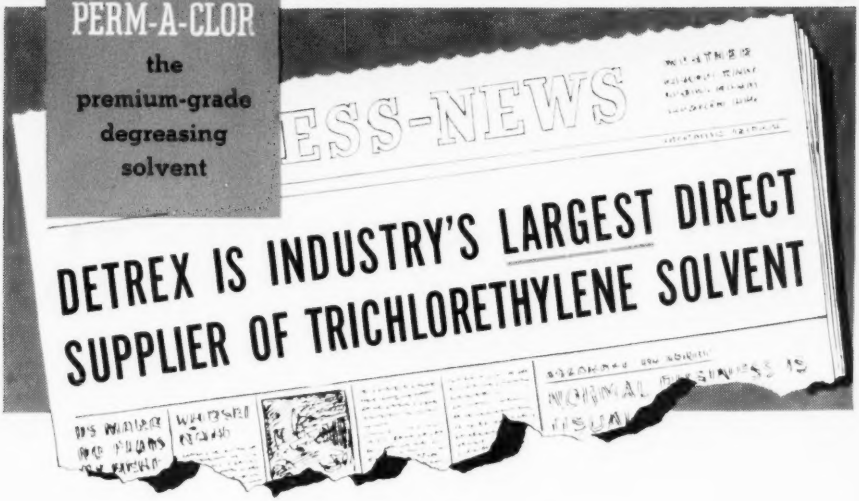

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